Arms Control: The Next Generation

Summary of the Eighth Annual International Conference on Controlling Arms

Defense Threat Reduction Agency

United States Department of Defense

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PREFACE

Controlling Arms: The Next Generation is a report on the presentations and discussions of the Defense Threat Reduction Agency's Eighth Annual International Conference on Controlling Arms. The conference is organized each year to provide a multinational forum for topics pertaining to policies, technologies, and operations of arms control, including treaty arrangements, cooperative threat reduction, and proliferation prevention and response. The 1999 meeting was held at the Waterside Marriott Hotel in Norfolk, Virginia, from June 1 to 4.

This report is a summary of the conference sessions, based on rapporteurs' notes and, in some cases, written material provided by the presenters. The speeches by Dr. Jacques S. Gansler, Admiral Richard W. Mies, and Congressman Dave McCurdy are presented verbatim as furnished by the speakers themselves or their respective agencies.

The views presented are those of the conference participants and do not represent the views of the Defense Threat Reduction Agency, the Department of Defense, Science Applications International Corporation (SAIC), or the Center for Verification Research (CVR).

Jeffery M. Heftman, Giuseppe Donadio, and Verne V. Wattawa of SAIC/CVR edited this report. The rapporteurs were Leslie Burchett, Jessica Kaplan, Michael McGovern, and Thomas McIlvain. The editors wish to extend their appreciation to Barbara Hester for her editorial and substantive support.

CONTENTS

OVERVIEW
CONTROLLING ARMS: THE NEXT GENERATION

Throughout the last four decades arms control has been promoted and applied as a diplomatic instrument of statecraft, a political framework for engagement, and a tool to limit, reduce, or eliminate an array of potential and actual security threats. The application of arms control is driven by security, economic, and political factors, which have changed drastically in the last decade of the 20th century. New realities shaping the international security environment must be recognized if arms control is to continue to play a vital role in U.S. national security policy. The 1999 International Conference on Controlling Arms addressed the challenges facing the arms control community as a result of new realities in technology, international security, and regional instability. These realities have significantly affected the world community since the 1998 Conference on Controlling Arms, which examined the impact of the Revolution in Military Affairs on arms control. The development of new technologies and continued diffusion and integration have forced the arms control community to reexamine its objectives and priorities based on new uncertainties.

The intervening year has been regarded by many as a setback for the arms control, nonproliferation, and export control communities. New challenges and threats have emerged, such as:

- Ongoing instability in South Asia. In the wake of their 1997 nuclear tests, India and Pakistan have continued to develop and test ballistic missiles of longer range. Furthermore, low-level conflict over Kashmir reoccurred. It is unclear whether a bilateral nuclear weapons threat will reemerge in this relationship and play a stabilizing role, as in the cold war;

- North Korea's continued testing of longer-range ballistic missiles and its economic stagnation resulting from its command economy and agricultural shortfalls threaten to further destabilize the region;

- A halt to inspection activity in Iraq by the United Nations Special Commission (UNSCOM) and the division within the United Nations Security Council (UNSC) over the future of UNSCOM's role in Iraq will have implications far beyond Iraq. A UNSC unable to enforce multilateral objectives could have devastating effects on the future of multilateral arms control and the development of international norms;

- Negotiations towards a Biological Weapons Convention (BWC) Protocol are ongoing but are making little progress in developing an acceptable international verification system. Opposition by the Non-Aligned Movement over supplier groups such as the Australia Group shows little sign of abatement. Continued Russian obfuscation of its chemical and biological weapons programs threatens to weaken the BWC and erode evolving international norms; and

- The Strategic Arms Reduction Treaty (START) II continues to languish in the Russian Duma with limited prospect for ratification. While NATO intervention in Kosovo served as a useful scapegoat for the Duma's delay, the core issues af-

fecting continued nuclear threat reduction remain the future of strategic stability and the evolving offense/defense relationship. The U.S. political commitments to the deployment of a National Missile Defense (NMD) and the required modification of the Anti-Ballistic Missile (ABM) Treaty are closely linked to continued bilateral reductions in strategic nuclear weapons.

The emergence of new security threats, technologies, and challenges warrants new focus on the future role of arms control in the first decade of a new millennium. In order to address these emerging issues, the United States Defense Threat Reduction Agency (DTRA) held its Eighth Annual International Conference on Controlling Arms from June 1 to 4, 1999 in Norfolk, Virginia. Approximately 400 individuals from ten countries attended the conference, representing government, military, industry, research and development, and academic communities.

The theme of the 1999 conference was *Controlling Arms: The Next Generation.* The Conference reviewed threat reduction, arms control, and nonproliferation tools that are necessary to counter new security challenges. Among the topics specifically addressed during the conference were the future of strategic nuclear arms control, the challenge of controlling dual-use technology, such as information technology and biotechnology, prospects for conventional arms control, Cooperative Threat Reduction (CTR), and the role of on-site inspection.

The conference theme was highlighted in the opening remarks by Dr. Jay Davis, the Director of DTRA. He noted that while this is the eighth conference in a series held by the Department of Defense, it is the first held under the direction of the new combat support agency, DTRA. DTRA was formed to address the very threats and tools which were the subject of the 1999 conference – arms and export control, treaty inspections, CTR, and the development of offensive and defensive tools to counter weapons of mass destruction (WMD) and strike against their possessors. Dr. Davis indicated that DTRA is well positioned to embrace these challenges, as well as future developments that may emerge.

The keynote speaker, the Honorable Jacques S. Gansler, Under Secretary of Defense for Acquisition and Technology, focused his remarks on the challenge of preventing proliferation in a century of new security threats and concerns. A transcript of Dr. Gansler's address is included in this summary. He indicated that serious review of past arms control lessons learned must be undertaken in order to better prepare for future security challenges. The formation of DTRA represents the commitment on the part of the Department of Defense and the U.S. government to meet future threats. Technological innovation, as applied to force modernization and arms control implementation, is one tool of many that must be developed further. However, the benefits accrued from these advances also represent a potential node of vulnerability that can be exploited by enemies here and abroad.

Dr. Gansler stateded that one of the key challenges in the coming century will be to reconcile economic and security priorities. The explosion of applications and new techniques in biotechnology poses new challenges for establishing an effective balance between export control and technology transfer. The prime challenge facing the United States in the next century is to develop new systems, technologies, and capabilities that support both force planning and arms control objectives.

During the first conference luncheon, General-Colonel Volodymyr Oleksiyovych Mikhtyuk, Ukrainian Deputy Minister of Defense, offered his insights into Ukraine's role in the CTR program. A summary of his remarks is included in the conference proceedings. The Ukraine's successful nonproliferation efforts – the denuclearization of a state in possession of the world's third largest nuclear arsenal – serves both as a valuable lesson for future initiatives and represents one of arms control's greatest accomplishments in this decade. Assistance provided under the CTR program was essential to this accomplishment, and General Mikhtyuk indicated that the program continues to reduce the WMD threat through the elimination of Ukraine's weapons infrastructure. The lesson to be learned through the CTR experience in Ukraine lies in the development of trust and cooperation towards achieving a common aim – reducing the threat posed by WMD.

Admiral Richard W. Mies, Commander-in-Chief, U.S. Strategic Command, delivered the featured after-dinner speech in which he addressed the interplay between arms control, force planning, and the U.S. strategic nuclear deterrent. A transcript of the Admiral's remarks is included in the proceedings. While strategic nuclear forces have been placed at a more relaxed state of alert, they still play an essential role in U.S. national security policy. The Admiral indicated that, while current relations with Russia have soured due to the conflict in Kosovo and Russian economic and political issues, he regarded the course towards continued bilateral strategic reductions as a stable one. Deploying a strategic defensive system is inevitable, but deployment decisions must take into account the necessity of maintaining a strategic balance with Russia while slowing China's strategic buildup. He cautioned that arms control, an important element of national security, should not be regarded as an end in itself.

During the final luncheon speech, Congressman Dave McCurdy, President of Electronic Industries Alliance, offered insight into the WMD threat from both a congressional and industry perspective. Congressman McCurdy's speech is included in the conference summary. He advocated greater coordination within the government to address the WMD threat. He opined that a good first step towards a coordinated response would be elevating DTRA's position within DoD to the Assistant Secretary level. Organizationally, he indicated that congressional budgeting for military procurements, such as force protection and counterproliferation, requires consolidation and reform within its various authorizing committees. He also examined the economic and security linkages that represent both a challenge and an opportunity to policymakers.

Along with the featured speakers, plenary and panel sessions discussed various aspects of the conference theme. The first plenary session, *The New Face of Controlling Arms*, examined future arms control challenges from an international perspective. Nuclear proliferation in South Asia, and the domestic and international factors that led to India's and Pakistan's respective decisions to conduct nuclear tests, was a topic of considerable debate. Session members addressing this issue advocated an approach that seeks to reduce the risk of nuclear conflict, while recognizing that a rollback of existing nuclear status would not occur. The prospects for arms control in the Middle East and a successful conclusion to ongoing peace talks were also addressed. Finally, developing a stable future strategic relationship between the United States and Russia was addressed. The panelists emphasized that the unique constraints and threats faced

by each nation as it attempts to find the optimum offense/defense balance must be considered. For the United States those constraints include a ballistic missile threat from rogue states while Russia is challenged to maintain strategic parity in the face of severe economic constraints.

The second plenary session, *Proliferation and Controlling Arms: Countering the Spread of Weapons of Mass Destruction*, assessed the effectiveness of nonproliferation initiatives, as well as the prospects for new approaches to reduce the WMD threat. Development of both technological and human resources is necessary to combat the risk of undetected proliferation activity. In many instances, the role of technology is limited by the need to gauge intentions rather than capabilities. Discussion during the session addressed the need to foster a nonproliferation community capable of analyzing future threats, and internationalizing a commitment to arms control and nonproliferation. The importance of multilateral arms control agreements and the need to fully exercise their verification provisions, such as challenge inspections under the Chemical Weapons Convention (CWC), was regarded as a high priority for policymakers in the coming decade.

The final plenary session, a roundtable discussion on *New Directions in Controlling Arms,* examined many of the issues raised in earlier speeches and sessions, and looked towards the next decade's threat reduction opportunities and security challenges. Panelists agreed that strategic nuclear arms reductions should continue to be regarded as a national priority, but that greater proactive leadership is required in this area. While its shape and scope remain undefined, the deployment of a National Missile Defense and the modification of the Anti-Ballistic Missile Treaty, should be regarded as inevitable. Debate ensued on the role of NMD within the strategic balance among the United States, Russia, and China. The goal of NMD – to reduce the threat posed by ballistic missiles – will not be achieved if its deployment triggers a destabilizing arms race amongst the nuclear powers.

Significant attention was directed to the threat posed by biological weapons (BW) from both states and transnational actors. Panelists concurred that, while progress has been made in the area of force protection, efforts must be redoubled to ensure the U.S. forces, allied coalition members, and the domestic populous are protected from the BW threat. At a domestic level, panelists called for increased coordination within the counterproliferation, arms control, public health, law enforcement, and emergency preparedness communities.

The most pressing threat to the future of multilateral arms control, in the panel's estimation, is the uncertainty over UNSCOM's future in Iraq, and its implications for the legitimacy of the UNSC as an arbiter of international security. Absent a unified Security Council and a reinvigorated UNSCOM role in Iraq, the future role of multilateral arms control is an uncertain one.

The panel sessions evaluated more specific issue areas under the overall theme of *Arms Control: The Next Generation*, addressing the future of nuclear arms control (Panel 1); new challenges in conventional arms control (Panel 2); controlling emerging technology (Panel 3); dual use technology and biological weapons (Panel 4); the role of on-site inspection (Panel 5); and the future role of the CTR program (Panel 6).

The first panel discussion, *Is There a Future For Nuclear Arms Control?* evaluated the future course of nuclear threat re-

duction. Continued bilateral reductions in strategic nuclear weapons between the United States and Russia are dependent upon future negotiations on the evolving offense/defense relationship. Such negotiations would focus on the deployment of an NMD by the United States, and Russia's need to use multiple independently targetable reentry vehicle (MIRV) systems to maintain a strategic offensive balance. The expansion of strategic reductions to encompass other declared nuclear powers is a likely scenario in force levels envisioned beyond START III.

Panel Two, *What Are the New Frontiers in Conventional Arms Control?* focused on an area that, in the past, has not received the attention given WMD arms control. The use of politically-binding confidence building measures and legally binding obligations were examined, as well as the disadvantages inherent in regarding these types of agreements as distinct. The recently ratified Ottawa Treaty, which bans anti-personnel landmines, was also discussed. It is unclear whether future agreements will follow this treaty's model, which deviates significantly from traditional arms control treaties codified by strong verification and compliance regimes. The dynamic between arms control objectives and force planning requirements was highlighted within this debate, and should serve as a warning against embracing arms control agreements without recognizing their role within a larger national security policy.

Information warfare was the topic of debate in Panel Three, *Emerging Technologies – Should They Be Controlled?* Policymakers continue to seek a more complete understanding of the economic and security implication of the Revolution in Military Affairs (RMA) and the threat of information warfare. Discussion focused on the security implications of the near-total integration of information technology into military planning and society at large. Panelists also addressed the prospects for technology regulation and control through either international law or bilateral treaties.

The dilemma of controlling dual-use technology, particularly biotechnology, was addressed during Panel Four, *Dual Use Technology – Can Its Transfer and Export Be Controlled?* BW development is less constrained by material than information, thereby reducing the efficacy of traditional export control policies. While ongoing negotiations for a BWC Protocol have encountered numerous obstacles, the merits of a regime capable of enforcing and monitoring compliance demand the continued expenditure of political capital.

Panel Five addressed the topic, *What is the Role of On-Site Inspections in Future Arms Control Agreements?* The relative value of on-site inspection (OSI) in bilateral and multilateral regimes was one topic of debate. While OSI has a role within a larger intelligence collection and treaty implementation strategy, panelists addressed its limitations in the face of concerted concealment efforts and political and security-related constraints.

The final panel session, *Cooperative Threat Reduction – Is It the Future of Arms Control?* evaluated past successes and prospects for continued progress using the threat reduction model. Panelists discussed future initiatives in existing recipient states, such as Russia and Ukraine, as well as the need for greater international donor participation. Due to continued uncertainties in Congress over the efficacy of the program, greater multilateral support may be necessary if the CTR model is to be applied in other regions of conflict and proliferation.

Several overarching themes emerged from the conference discussions. They include:

- Implementation of existing arms control treaties and agreements is essential to the continued credibility of international norms. The ultimate impact of these agreements will depend on the vigorous implementation of their verification and compliance provisions, as well as a unified UNSC capable of demonstrating a commitment to punish states that act outside the boundaries of international law. Failure to enforce agreed-upon codes of conduct, either by not using available verification tools or through multilateral disunity, will signal tacit approval for noncompliance and proliferation;

- The U.S. nuclear deterrent is, and will remain, the cornerstone of U.S. national security policy. Nuclear threat reduction must assume a greater priority, both to reduce nuclear dangers, and to demonstrate the United States' commitment to reducing strategic arsenals. However, those reductions must occur with recognition that nuclear weapons will remain a central element of U.S. security planning well into the next century. A credible nuclear deterrent, and the security assurances the United States extends to allied states, is a key nonproliferation tool;

- Deployment of an NMD by the United States is inevitable. Modification of the ABM Treaty will likely require some U.S. concessions on Russia's retention of a MIRVed ICBM capability. As strategic force levels decline to meet envisioned START obligations, the introduction of defensive systems will make the challenge of maintaining strategic stability more difficult. Technological uncertainties aside, a deployed NMD system must be configured to counter a ballistic missile threat from a rogue state without rendering the United States invulnerable to Russia's and China's strategic capabilities – an unstable equilibrium that would result in a major arms race. China's strategic nuclear forces will continue to grow in number and sophistication; a key U.S. priority is to influence the pace of that development. The introduction of a nonwithdrawal clause in an ABM Treaty modification agreement would help preserve the strategic balance and stability. The clause would commit the United States and Russia to a number of interceptors capable of addressing missile threats from a rogue state but below China's projected strategic force levels;

- China's place in the new world order in the coming decade is uncertain. As strategic force levels decline and policymakers envision agreements beyond START III, force reductions must include other nuclear powers. It remains unclear whether the U.S.-China relationship will revolve around a strategic partnership or rivalry. China's commitment to international nonproliferation objectives will be a key indicator of whether the UNSC will function effectively. Internal factors, such as the future of Taiwan, bear greatly upon China's international support for intervention in a sovereign states affairs, such as in Kosovo or Iraq;

- The challenge of controlling threats posed by chemical and biological weapons and information technology presents new problems. In many cases, these threats are information-limited rather than materiel constrained. As concerns

the BW threat, greater coordination amongst the arms control, public health, and law enforcement communities is needed at a national level. Effective responses to these threats span a full spectrum of options; including confidence and security building measures, threat reduction, arms control, export controls, sanction, interdiction, and intervention. The nexus between nonproliferation and counterproliferation is an area in need for greater attention. Traditional arms control instruments, such as export controls, may prove ineffective in these instances. In the face of these emerging threats, the threshold for the employment of counterproliferation options, as opposed to arms control tools, may be lowering;

- It is unclear where the threat of information warfare and information technology falls into the nonproliferation and counterproliferation response spectrum. The arms control community must identify the tools that can effectively respond to the threat in coming decades. To date, efforts addressing the information warfare challenge have been isolated, owing to a lack of coordination and forward thinking about its dual potential. It is clear, however, that the United States must take a leadership role in this area in order to control the diffusion and nefarious application of this technology;

- The CTR program in the former Soviet Union has achieved major nonproliferation successes. The denuclearization of three states and the implementation of effective controls against the spread of weapon of mass destruction have significantly shaped the current security environment. Efforts to use the CTR model in other regions of proliferation concern must, however, be approached with caution. The foundation of threat reduction is the existence of trust between partners – an element lacking in many regions of potential employment. In the absence of a cooperative relationship, threat reduction activities will fail to duplicate successes achieved in the former Soviet Union, and may prove counterproductive in altering the behavior of participating states;

- Effective solutions to regional crises must be tailored to address unique security realities. A window of opportunity now exists in which progress can be made in South Asia, where effective confidence and security building measures may solidify regional nuclear stability. Similarly, the prospects for stability in the Middle East depend greatly on progress on peace negotiations. The region may soon cross a dangerous proliferation threshold, which will change the security dynamic and prospects for peaceful resolution of territorial disputes; and

- Lastly, proactive U.S. leadership will be essential in responding to the myriad of threats to international security in the coming decade. As Russian Duma and U.S. Presidential elections near - events that will delay arms control progress - an opportunity exists to engage in a rigorous intellectual debate on the future course of arms control and nonproliferation. Coherent new policies, backed by a sustained and unified leadership, must address evolving strategic relationships with key states, the correct means to counter emerging new threats, and the role that the United States will play

within the international security environment in the early stages of the next century.

The ninth conference in the series will be held in Norfolk, Virginia, from May 30 to June 2, 2000. The DTRA annual conference has become an important venue for the international discussion of arms control, nonproliferation, and threat reduction, and the organizers are committed to maintaining the acknowledged excellence of the participants and the diversity of affiliations and views.

KEYNOTE ADDRESS BY
THE HONORABLE JACQUES S. GANSLER
Under Secretary of Defense (Acquisition and Technology)

We meet at a critical time, and on a topic that may well determine the future security of the many nations represented here. I cannot overemphasize the importance of this three day conference, nor of the significance of the fact that the issue we are addressing can only be addressed through a fully coordinated and cooperative effort – as reflected in the high level and widely diverse speakers (from many nations) on this program.

Just last week, an editorial appeared in the Washington Post entitled, "Weapons spreading" (by William Potter and Jonathan Tucker). They began, "The fabric of treaties, informal agreements, and export control measures designed to halt the spread of nuclear, chemical, and biological weapons of mass destruction is under siege. Recent assaults on the nonproliferation order come in many forms: the erosion of Russian-American cooperation on nonproliferation, the emerging Indo-Pakistani nuclear and missile arms races, Iraq's defiance of U.N. Security Council-mandated weapons inspections, North Korean nuclear and missile brinkmanship, the threat of a new U.S.-Russian tactical nuclear arms race, and the prospect of a fractious year 2000 review conference of the Nuclear Non-Proliferation Treaty (NPT)." They could have gone on and discussed many other recent issues, from increasingly frequent information warfare attacks, to the deterioration in U.S.-China relations, to the current events in Yugoslavia. These are, indeed, critically important times for the future security of the world.

The reality, of course, is that while we are already living in an era of "new threats," we are about to enter a new century where the emerging power of rogue nations, the rise of transnational terrorists, and other equally dramatic geopolitical events will merely intensify current threats directed at each of us. Whatever the intensity of these threats, they – and the revolutionary advances in science and technology that will accompany the millennium – will surely transform our historic vision of security needs and of military operations.

Now, almost a decade after the end of the cold war, it is essential that we reexamine the arms control lessons of years past and prepare for the challenges of the century to come. In this new era, we find ourselves without the fixed bi-polarity and superpower competition of a cold war, in which only a few states possessed nuclear stockpiles. We must add to our cold war lessons a fresh analysis of our new constraints, our new abilities, and our new threats. James Russell Lowell once said that "he who is firmly seated in authority soon learns to think security, and not progress, the highest lesson of statecraft." I hope, however, that this conference will look to the future and illuminate the added security that we all might, in fact, enjoy through collective progress in threat reduction efforts.

For the United States, the necessities of constraints and the reality of changing threats have brought about, among other things, the creation of the agency which sponsors this conference. As part of Defense Secretary Cohen's Defense Reform Initiative, announced just 18 months ago, the De-

fense Threat Reduction Agency [DTRA] embodied our desire to reshape the collection of expertise, experience, and resources in the Department of Defense to keep up with a changing proliferation threat and a growing chemical, biological, and nuclear threat, as well as on-going – and evolving – arms control and inspection regimes.

This conference will identify and examine many of the arms control, export control, and proliferation prevention challenges facing America and the world in the next century. Moreover, it is the only conference sponsored by the Department of Defense that addresses the key issue of cooperative efforts in proliferation prevention. The theme of the conference, and the challenge before us, is how to move forward into the 21st century and develop new systems and capabilities that meet both our force structure and our arms control goals – in the changed world environment.

As the U.S. Defense Acquisition Executive, I want to personally emphasize that the extreme financial burden of renewed arms races and strategic buildups run absolutely counter to our goals in acquisition reform, force modernization, cost savings, and reduced budgets. We have a responsibility to the military force planner to provide, instead, a modernized, affordable force that meets the challenges of the "Revolution in Military Affairs" – within severe budget constraints.

Arms control and threat reduction are therefore key components of both our national security strategy and our acquisition goals. We must meet the force planning requirements necessary to respond to international threats, while at the same time we must use arms control to reduce that threat. Thus, we must promote confidence in compliance with international regimes; increase their scope; and increase transparency.

Today, we face a new, increasingly daunting task in meeting the challenge posed by the growing spread of weapons of mass destruction (and their delivery vehicles); pursued by a new type of rogue, sometimes transnational, actor; and complete with an entire new and complex set of questions. We need to address questions such as: How to much more effectively integrate nonproliferation and counterproliferation initiatives into the larger national security picture? How to prevent political, economic, and technological realities from impeding or reducing the effectiveness of nonproliferation objectives and their respective regimes? And, how to prevent the effects of such realities from constraining our ability to verify other nations' compliance with these regimes (such as the political constraints on UNSCOM [United Nations Special Commission], or the absence of a challenge inspection under the auspices of the Chemical Weapons Convention)?

The same Revolution in Military Affairs that challenges us to modernize our warfighting capability to meet the demands of a changed battlefield will also have a tremendous effect on efforts at threat reduction. Last year, this conference actually focused on precisely this idea, "Arms Control and the Revolution in Military Affairs." It was observed that technological advances will change the way we perceive, detect, and reduce threats to our national security. For example, the use of remote monitoring and detection technology can assist arms control regimes, such as the Chemical Weapons Convention, to meet verification and compliance aims.

Technological advances, however, represent a double-edged sword. The challenge of emerging technologies will be to maximize the benefits of new and innovative technological breakthroughs as aids in pro-

liferation control, while discouraging the use of these increasingly available and inexpensive resources to allow rogue actors to easily obtain weapons of mass destruction and their delivery vehicles.

Without a doubt, strides in monitoring and detection technology aid compliance efforts and increase confidence in control regimes. The near total integration of information systems into our society – into both the public and private sectors alike – will serve to advance everything from our ability to learn, process, store, and send information, to our ability to communicate and work together. Yet, that availability, integration, and often more open information architecture also represent vulnerabilities for others to exploit.

The question of controlling the threat of information warfare, including space and satellite technologies, needs to be fully examined to both identify the true nature of its threat-potential, and to be able to effectively respond in the future. The recent transfer of satellite licensing authority from the U.S. Department of Commerce to the Department of State is a strong example of the U.S. commitment to prevent the leakage of technologies for the purpose of undesirable military application.

No one can ignore that we are all increasingly affected by the changing economic relationships, and occurrences, around the world – caused by "industrial globalization." Economic and security priorities, however, are often at odds. The ability to reconcile these equities will be an increasingly difficult challenge into the 21st century. One area of concern is the field of biotechnology and determining how the twin issues of technology transfer and export controls reconcile when applied to the realm of biotechnology. Nowhere is the dual-use dilemma as strong as in this sector, where legitimate advances in the pharmaceutical industry may have the potential to be used in the manufacture of biological agents. Yet, the strong link between the defense world and the pharmaceutical industry is required for biological defense (for example, in the development of broadband vaccines).

Today, the issue of industrial technology transfer is a top priority issue for senior DoD management. The goal is to enable us to embrace "globalization", while at the same time, protect our national security and prevent our technological advances from falling into the hands of potential adversaries. We realize that international armaments cooperation increases the potential security risks involved in the transfer of militarily significant technology. Yet, such cooperation is essential in a world in which "coalition warfare" is the likely case; and, therefore, where comparable weapons performance and systems interoperability are required for effective military superiority. To eliminate the risks of international armaments cooperation, we must ensure that adequate controls are in place to eliminate the transfer of technology outside a group of select members who are in agreement as to those controls – in both principle and practice – or even into the commercial world. This, of course, requires governments and firms to recognize the new security environment – one where fences and visitor controls are perhaps less critical than cyber controls.

One of the major issues of the early 21st century, then, is how to expand the defense industrial structure globally; how to achieve a truly global marketplace, and yet control militarily significant technology. Industrial globalization can provide us a way to help meet the challenge of a widening technological gap among members of our coalition partnerships. And this positive

trend towards globalization must also be accommodated by an equally positive trend towards greater civil/military industrial integration. Again, however, we must do this in a way to still control critical national security technologies – an admittedly difficult challenge.

While events in the Balkans have delayed the ratification of START [Strategic Arms Reduction Treaty] II by the Russian Duma, the likelihood of a bilateral reduction to START II levels – and possibly to those envisioned by the accords reached in Helsinki and New York – seem inexorably linked to the prospects of new defensive systems. Here, new approaches must be found to balance the goals of continued strategic stability, between the U.S. and Russia, and a counter to the threats posed by the acquisition of long range ballistic missile systems by rogue states.

Arms control requirements have driven changes in the force structure in many areas, including the strategic nuclear deterrents. The idea of transitioning SSBNs to SSN attack submarines is one example of how an arms control-driven force drawdown may result in the restructuring of our forces in a manner that saves resources, improves defensive capabilities, and should be capable of complying with treaty restrictions. Nowhere is the symbiotic relationship between force requirements and arms control more apparent than in the debate over the Anti-Ballistic Missile [ABM] Treaty and the concept of National Missile Defense [NMD].

Some twenty countries possess or are developing weapons of mass destruction. More than twenty nations have theater ballistic missiles or cruise missiles. Many states continue to progress in developing longer-range ballistic missiles. With a U.S. deployment decision on NMD likely by the middle of 2001, negotiations on ABM Treaty modifications will certainly be required. This, of course, presents a challenge. The planned NMD system will be designed for a limited threat, and deployed in sufficiently limited quantities, to clearly only create a defense against a small number of long-range ballistic missiles from rogue states – nations against whom traditional deterrence methods are likely to prove ineffective. This deployment, however, is not designed for, nor would it be effective against, a large number of sophisticated missiles, and thus should not affect the intent of the ABM Treaty. Nevertheless, successful negotiations over the coming months will be critical.

Advances in technology will also play a major role in on-site inspection as a supplement to inspection personnel, both in promoting transparency and in reducing the hefty verification costs. In some cases, as witnessed with UNSCOM in Iraq, remote-monitoring technology may prove to be a less politically sensitive option than an inspection presence. Yet, our recent experience with on-site inspection under the auspices of different regimes – particularly UNSCOM and the Chemical Weapons Convention – clearly demonstrates the need and effectiveness of on-site inspection for future arms control regimes and challenges, such as the Biological Weapons Convention and Fissile Material Cut-off Treaty (FMCT).

Also, technology certainly aids in increasing transparency and – when put in the context of an inspection or arms control regime – can improve dialogue and help foster an atmosphere of trust. The value of transparency created in a multilateral forum of willing states is a critical element of U.S. nonproliferation objectives.

Perhaps one of DTRA's most successful programs has been the Cooperative Threat Reduction Program [CTR] – as a

model for success in the field of nonproliferation. The program continues to achieve notable accomplishments in the former Soviet Union, including ICBM [Intercontinental Ballistic Missile], SLBM [Submarine Launched Ballistic Missile], and heavy bomber destruction, and the construction of a fissile material storage facility to safely store special nuclear material from systems being destroyed, as required by START. Thus, as a realistic example of forward-looking arms control efforts, CTR could provide a model for use as a threat reduction tool in other regions, or as a framework for the future of arms control in the 21st century. CTR plays a major role in assisting our Former Soviet Union partners in meeting arms control commitments. Most likely, international assistance will prove critical in order to assist Russia in meeting its obligations under the Chemical Weapons Convention to destroy the world's largest chemical weapons stockpile by 2007.

In conclusion Thomas Jefferson once wrote "as new discoveries are made, new truths disclosed, and manners and opinions change with the change of circumstances, institutions must change also and keep pace with the times." We have all been witness to the changes over the past decade – and, in fact, over just the past year – in the threats we face. The Defense Threat Reduction Agency is certainly at the forefront of America's institutional change to better understand and more effectively meet those threats.

Let me end on the same point with which I began: This conference is critical. Over the next three days we must work to find new and innovative approaches – with a solid foundation in cooperation – to the challenges we will all face in the next Century. The world's future security depends on it.

Thank you very much.

PLENARY 1
THE NEW FACE OF CONTROLLING ARMS

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Introduction

The political, economic, and security realities of a multipolar international security environment warrant consideration of the future role and scope of arms control. This security environment is complicated by the emergence of transnational and terrorist groups, which are developing capabilities that were previously limited to states, such as weapons of mass destruction (WMD). Enormous technological advances, along with notable political and social changes, have also been taking place. Arms control must adapt to address these new realities. U.S.-Russian strategic nuclear arms control is languishing, and regional arrangements have yet to provide the strong underpinning for national security that is needed in order to move ahead. In this context, it is valuable to absorb lessons from the past and apply them to the future. This session evaluated future arms control challenges from an international perspective.

Arms Control in South Asia

South Asia represents one-fifth of the world's population and approximately one-third of its nuclear capable nations. Lessons can be learned by examining South Asia's nuclear history and extrapolating into the future. The panelist identified six major issues that emerge when examining South Asia's nuclear history. First, and most importantly, is the fact that South Asia has irreversibly crossed the nuclear threshold. The panelist cautioned that nuclear threat reduction in South Asia should not be regarded as solely a bilateral activity in which India's and Pakistan's nuclear programs may be rolled back. China's role in a nuclear dialogue would be a prerequisite to nonproliferation progress.

Second, in examining how the nuclearization of South Asia occurred, lessons emerge that can be applied in the future. Throughout the evolution of India's nuclear weapons program, India consistently focused on enhancing its prestige and developing a global role. India was able to de-

velop its nuclear capability with some assistance from Western nations and by repeatedly rejecting various arms control proposals, including the creation of a regional nuclear weapons-free zone, the Nuclear Nonproliferation Treaty (NPT), and the Comprehensive Test Ban Treaty (CTBT).

Third, although India's policy has been largely consistent, it underwent a change in 1998 with the election of the nationalist Bharatiya Janata Party. Unlike its predecessors, the new government sensed that it could garner domestic support and international leverage by assuming an overt nuclear posture.

Fourth, India's preparations for its May 11, 1998, nuclear test were clearly visible yet solicited little international response. In fact, approximately six weeks prior to the test, Pakistan sent letters to the heads of state of several Western nations warning them of the upcoming test. The International Atomic Energy Agency (IAEA) responded that since India had not yet signed the NPT, it was not in violation of international law. The United States and other Western nations generally responded by pursuing additional cooperation with India rather than attempting to isolate it. The panelist contended that the failure of the nonproliferation community to adequately condemn India's action left Pakistan with little flexibility in its response.

Fifth, Pakistan decided to test its own nuclear device. This decision was made in part in reaction to the international response to India's test. It was also done for security reasons, as part of an effort to deter India from continuing with the confrontational rhetoric that began shortly after the successful conclusion of India's nuclear tests. Up until that point Pakistan's entire approach to its nuclear capability was based on ambiguity. However, its desire to introduce strategic deterrence into South Asia led Pakistan to fundamentally alter its stance. During the interval between India's and Pakistan's respective nuclear tests, Indian rhetoric spoke of a new reality in South Asia, in which India's nuclear posture would dictate terms to its neighbors. The panelist argued that Pakistan's nuclear tests reintroduced stability to the bilateral nuclear relationship. Pakistan's overt nuclear deterrent reduced the potential for Indian nuclear brinkmanship.

The sixth, and final, element resulting from an examination of South Asia's recent past is the likely failure of U.S. nonproliferation policy to fully grasp the circumstances contributing to India's and Pakistan's nuclearization. This is evidenced by U.S. activities in the period leading up to the tests.

Benefit is also gained from examining the future of the nuclear situation in South Asia while focusing on possible avenues forward. The panelist noted that three major issue areas emerge from this examination. The first and primary issue is the pursuit of threat reduction initiatives. These initiatives can be pursued in the following ways:

- getting India and Pakistan to sign the CTBT, which serves as a key barrier to qualitative nuclear escalation in South Asia and which, hopefully, will not be derailed by India's change of government;
- concluding a fissile material convention to address the stockpile issue;
- enhancing nuclear safeguards; and
- enacting controls on technology exports, which would reduce India's conventional weapons superiority and, there-

fore, decrease Pakistan's reliance on a nuclear capability.

In order to be successful any implemented threat reduction measures must be mutually applicable to all parties. Such strategic mutuality is central to any threat reduction measure.

A second area of focus is the continuing border dispute over Kashmir. This major area of tension between India and Pakistan should not be dismissed. Meaningful negotiations must take place to resolve this situation and allow enhanced stability to emerge. The root causes of the problem must be addressed in order for true progress to be made.

The third and final issue is nuclear disarmament. Despite widely held beliefs, the indefinite extension of the NPT will not allow recognized nuclear weapons states to maintain their capabilities. The panelist contended that South Asian nuclear proliferation demanded a reevaluation of the NPT's discriminatory policy towards nuclear possession. During the 2000 NPT Review Conference the commitment to nuclear disarmament must be pursued. In his estimation, no further progress can be made on the NPT until it is adjusted to recognize India's and Pakistan's nuclear capabilities. In the long term the NPT will have to be adapted to suit the new reality.

Global security would be greatly enhanced if nuclear disarmament were pursued. Based on the lack of prior success in disarmament, as compared to recent breakthroughs in eliminating chemical and biological weapons, it appears that a feasible target date or time limit might be the key to achieving the desired goal. Nuclear disarmament could, however, spur an arms race focused on advanced technology. Advances in technology could then lead to increased proliferation of "smart" weapons, the proliferation of which would be a function of their cost.

The panelist concluded that, given new realities in India and Pakistan, pursuing regional arms control measures might hold more potential than strictly focusing on nuclear disarmament. In order to increase the validity of such an approach, the focus must shift from South Asia to Southern Asia – stretching from Saudi Arabia to the ASEAN (Association of South East Asian Nations) divide. Progress in arms control would be managed by addressing individual objectives focused on vertical and horizontal proliferation components. Efforts to enhance stability in that region through strategic mutuality could also be pursued. Opportunities for effective threat reduction measures currently exist that should be exploited to their fullest.

Cooperative Threat Reduction in a Broader Context

The next panelist focused on the broader context of global and regional security matters and the role of cooperative threat reduction (CTR). He noted that one possible way to manage the complexities brought on by recent advancements in technology and strategy is to divorce the CTR program from the U.S.-Russian relationship and attempt to apply its principles more broadly. In order to apply the CTR model elsewhere in the world, a high level of trust between the nations involved would need to be achieved. This may mean that CTR efforts work best where they are needed least, and are least effective in regions where nations lack the trust required to implement such measures. By conceptualizing an appropriate approach for its application, the CTR model could provide the framework for future initiatives. This framework should recognize the uncertain human element

within threat reduction. If the CTR model is to be applied in unstable regions where weapons of mass destruction (WMD) are a threat, then a greater understanding of the decision making process within rogue regimes is required. During the cold war period, possessing nuclear weapons became synonymous with security. More recently, however, the proliferation of WMD – irrespective of their nature – has become synonymous with insecurity. Nations are beginning to rely on WMD to counter threats posed by larger conventional forces. Such reliance represents a perceived solution to a nation's security concerns, but can serve as a catalyst for further concerns. In addition, the bipolarity that prevailed during the cold war has been replaced in recent years with an expanded, "promiscuous" polarity. This paradigm shift needs to be recognized in the language used to describe the current situation and the tools used to address it.

Some states are beginning to view WMD as part of their strategic capability. However, the possibility exists that WMD can be managed through a tentative mix of power balancing and employing tools proven effective under the CTR model.

Regional Arms Control in the Middle East

Another panelist addressed the future of arms control in the Middle East. There are several factors that bear upon the prospects for regional arms control. Israel's new government is one factor that makes it difficult to judge how successful regional arms control initiatives might be in the near term. Another major element that must be taken into consideration is how proliferation is likely to affect the Middle East peace process. Part of Israel's motivation for racing ahead in negotiations with both the Palestinians and the Syrians is to resolve major issues before the Middle East crosses a dangerous proliferation threshold in approximately five to seven years. Once that threshold has been crossed, the prospects of reaching an agreement become much more difficult. Since there is no realistic expectation that a solution to the proliferation problem in the region will be discovered in the immediate future, a window of opportunity now exists that needs to be exploited.

Many in the region believe that the regional arms control process is vitally important and feasible. The Middle East peace process has simultaneously dealt with both bilateral and multilateral issues. Five negotiating groups have been established to deal with refugees, water, economic development, environment, and arms control. Although this process has not gained much attention, a great deal of progress was made in the 1992-1995 period. The formal process came to a standstill in 1995 primarily because of overloading the bilateral peace negotiations and the fact that the United States – which was a major driving force behind the process – began to turn its attention elsewhere. Since that time, progress has continued to be made on the informal, "track two," front through private and other governmental initiatives.

The spirit, motivation, and agenda still exist to move the arms control process forward. However, negotiating simultaneously with both the Palestinians and the Syrians means that Israel's political capital available to pursue regional arms control initiatives will be limited. The process could still be entertained, but the agenda would have to be carefully scripted. A regional security concept must be worked on in order to facilitate more ambitious undertakings at a later date. Also, with the results of the recent election, a more favorable cli-

mate is likely to emerge that could help reinvigorate the arms control process.

While regional arms control in the Middle East shows a great deal of promise, there must be a realistic agenda regarding what can and cannot be achieved. Areas of focus should include non-intrusive confidence and security building measures (CSBM) and the regional security process as a whole. Any progress is heavily dependent upon whether or not the United States seizes opportunities as they arise. In addition, the countries involved will not likely be supportive of any efforts to curtail their strategic capabilities.

The panelist went on to discuss the benefits and drawbacks of cooperative security agreements. A number of factors must be considered when evaluating these agreements. First is the probability of achieving these agreements, particularly in the context of the United Nations' Conference on Disarmament, where the size and ground rules of the group make it extremely difficult to accommodate regional and political differences and interests. This situation, in another panelist's opinion, is made even more complicated when globalization trends are considered. These trends include the uneven distribution of "peace dividends" resulting from the end of the cold war, internal weaknesses among states, and the increasing relevance of non-state actors.

Secondly, one must consider ways to improve the prospects of achieving cooperative security agreements while identifying the means to measure their effectiveness. Within this context one must take into account the overarching political and economic environment as well as the individual deals reached between the major parties.

Thirdly, the United States plays an important leadership role in negotiating cooperative security agreements and it is expected to bear a disproportionate financial burden in implementing them. Other factors complicating the U.S. role are its isolation when it advocates the use of force to help resolve disputes, and its lack of internal support when pursuing a leadership role in negotiating cooperative agreements.

Traditional arms control involving negotiated treaties is diminishing in value because it is not capable of ensuring compliance. This is particularly evident by the emergence of states that either abuse existing norms or remain outside of the treaty regimes. However, an increased focus on threat reduction through regional CSBM would have a positive impact on arms control at large.

Successful threat reduction must identify and address the fact that political realities are intertwined with technical issues. While it may be tempting to use the U.S.-Russian CTR program as a model for success, all technical problems cannot be resolved by working groups without addressing the political framework in which they reside. A high level of cooperation and trust would have to be achieved before the CTR program could truly serve as a model for future cooperative agreements. Consideration should be given to the potential role of the IAEA in any regional arms control agreements. However, traditional arms control should not be totally discarded; some focus should be maintained on treaties like the Strategic Arms Reduction Treaty (START) II and the CTBT.

Evolution of U.S.-Russian Bilateral Arms Control

A panelist noted that a great deal could be learned about potential future arms control arrangements by examining the U.S.-Russian bilateral relationship. In the

1990s, the United States and Russia made great progress in arms control, moving further than ever before. This bilateral process is now at a crossroads, however, as global events hamper further openness and cooperation between the two nations. The foundation of the U.S.-Russian relationship is its continuing dependence upon the principle of strategic stability. This principle maintains that nuclear vulnerability underpins the U.S.-Russian relationship. START II and the continued adherence to the Anti-Ballistic Missile (ABM) Treaty are clear examples of the application of strategic stability. However, now that the two nations appear to be moving toward a more confrontational relationship, START II does not appear to be in Russia's interests and the ABM Treaty is not responsive to current U.S. concerns.

Russia is in fact extremely interested in negotiating a START III treaty that calls for significant reductions in the number of strategic nuclear weapons. However, due to the high costs and required force structure changes, it would be very difficult for Russia to implement the complete ban on multiple independently targetable reentry vehicles (MIRV) called for in START II. A START III agreement would require a commensurate reduction in the U.S. warhead uploading potential, an objective that Russia will pursue in any future strategic nuclear arms control negotiations. If modification of the ABM Treaty and progress on START II ratification is to be achieved, the panelist offered that it would likely include U.S. concessions on Russia's retention and deployment of the three-MIRVed Topol-M Intercontinental Ballistic Missile.

With regard to the ABM Treaty, the current Russian administration is firmly opposed to amending the Treaty while the United States is beginning to actively pursue further development of its missile defense capability. For political reasons, the Russian government would like to maintain the status quo for the ABM Treaty for as long as possible. Because a complete definition of territorial defense has not yet been developed, discussion on amending the ABM Treaty must remain flexible. Whether or not deployment of a defensive capability should be viewed as a territorial defense will need to be determined. Overall, a great deal of attention should be given to whether or not Article III of the Treaty should and can be amended to the satisfaction of all parties concerned.

A new understanding of U.S.-Russian strategic relations is clearly needed. A re-evaluation of the principle of strategic stability is therefore in order. This re-evaluation should take place within the context of future U.S.-Russian negotiations related to their security, and potential areas for cooperation in threat reduction and missile defenses. By focusing on the real demands of states, the future U.S.-Russian relationship could be further enhanced.

Summary

In order to remain successful in the post-cold war era, arms control must undergo a number of changes. New techniques or the revision of existing methods will contribute to future successful arms control activities. With the movement away from the U.S.-Russian bipolar focus, which prevailed throughout the cold war period, additional attention must be paid to regional and cooperative security measures suited to the current multipolar environment.

The current crossroads in arms control is not the first. The focus on limited measures which emerged during the late 1950s, the conceptual turning point toward arms control which occurred in the early 1960s, and the strong focus on nuclear is-

sues by the Reagan Administration during the 1980s all had major impacts on approaches towards and agreements on arms control measures. A new approach to arms control is once again needed in order to clean up the legacy of the cold war. This approach will need to take a number of factors into consideration, including the emergence of sub-state security threats, significant technological advancements, conventional arms control issues such as arms transfers, and post-conflict operations. Even with these factors, arms control alone, may not emerge as the best approach to enhanced security in the future.

SUMMARY OF LUNCHEON ADDRESS BY GENERAL-COLONEL VOLODYMYR OLEKSIYOVYCH MIKHTYUK
Deputy Minister of Defense, Ukraine

Following the dissolution of the Soviet Union in 1991, Ukraine temporarily assumed the status of the world's third largest nuclear power, owing to its possession of part of the Soviet arsenal. Included in this arsenal were 130 intercontinental ballistic missiles (ICBM), with an inventory of 1,272 nuclear warheads, and 44 heavy bombers equipped with long range nuclear missiles. In 1994, Ukraine ratified the Strategic Arms Reduction Treaty (START), and began to pursue a policy to completely eliminate its nuclear weapons and associated delivery systems. Though legal, technical, and financial challenges remain, our nation intends to complete the elimination of its weapons of mass destruction (WMD) and related infrastructure in the shortest possible time. As of 1999, tremendous progress has been made towards reaching this goal.

In 1993, a framework agreement was signed by the United States and Ukraine, which directed technical assistance towards strategic nuclear weapons elimination and WMD nonproliferation program. Additional implementing agreements concerning the elimination of nuclear weapons were also signed later that year. These agreements provide Ukraine with assistance in the form of technical-material supplies, services, and corresponding staff training for strategic nuclear weapons elimination and removal from the Ukraine. Assistance also included materials and technical assistance necessary to establish a government to government communication link.

However, the program was not fully implemented in 1993 due to the lack of an appropriate bilateral legal mechanism. But in 1995, agreements with integrating contractors were finalized and, at that point, the program of weapons elimination commenced. An agreement for cooperation in WMD infrastructure elimination was also signed in 1995.

Along the way, cooperation between the U.S. Department of Defense (DoD) and the Ukraine Ministry of Defense (MOD) has been outstanding, and a good working relationship has been established. The program is well organized and the level of U.S. financial and technical support has been instrumental in helping Ukraine meet its START Treaty obligations. Most importantly, an international legal basis for cooperative threat reduction has been created and embodied in the several U.S.-Ukraine agreements on technical assistance for strategic nuclear weapons elimination programs, WMD nonproliferation, WMD infrastructure elimination, provision of materials and equipment, inter-governmental communications, emergency planning, and staff training. A joint program control plan has also been established placing these activities under strict U.S. and Ukrainian government supervision.

Among the critical issues that have been collaboratively addressed are: ecological support for destruction activities, repair guarantees for equipment provided by the United States, technical provisions for missile decommissioning, repair of railroads and related infrastructure necessary for dismantlement and decommissioning programs, and extracting and salvage of power and communication cables from ICBM silo fields.

A system has been put in place to supervise the team of U.S. prime contractors executing the elimination process. The reporting chain of responsibility includes both the Defense Threat Reduction Agency (DTRA) and the Ukrainian Deputy Minister of Defense staff, where a Center of Elimination Control has been established. In addition, joint progress meetings are held biannually.

The safety record of the Ukrainian elimination program is excellent. No accidents have occurred to date in the millions of man-hours worked. Both prime contractors and subcontractors have approved safety plans, and safety managers have been appointed at all working locations.

The Cooperative Threat Reduction (CTR) program has achieved several notable accomplishments in Ukraine. They include the removal of 1,272 ICBM warheads and 672 Air-Launched Cruise Missile warheads, which were safely sent to Russia; the removal and storage of 13,500 metric tons (MT) of highly toxic liquid propellants from SS-19 missiles; the neutralization and elimination of 111 SS-19 missiles; and the destruction of 130 SS-19 silos. At silo sites, 3,194 km of cable has been extracted, 45,102 MT of scrap metal has been extracted, and 69,440 MT of related equipment has been dismantled.

Planning is underway for destroying the existing warhead storage infrastructure, SS-24 dismantlement and solid rocket fuel extraction, as well as the decommissioning, elimination, and salvage of the TU-160 and TU-95MC heavy bombers.

Since 1995, the United States has provided $85 million worth of equipment and materials for silo elimination programs. In addition, 433 Ukrainian firms have been involved on more than 1,200 contracts, and $16 million worth of medical equipment has been donated by the United States to the Ukraine MOD.

Ukraine envisions that the CTR program will continue to achieve noteworthy objectives. Future programs may include the elimination of former Soviet advanced conventional weapons such as tactical missiles, anti-aircraft missiles, aviation bombs, torpedoes, anti-personnel landmines, and constructing new homes for demobilizing Strategic Rocket Forces officers. Support may be sought for employing retired servicemen from the Strategic Rocket Forces to construct international transportation corridors in the Ukraine.

In conclusion, the United States and Ukraine have demonstrated to the world the value of cooperation in eliminating WMD. The Strategic Arms Elimination (SAE) program can be summed up by one word – success. By December 2001, Ukraine will have met its obligations under the START Treaty, and will have begun discussions with DoD concerning additional programs outside the scope of the original SAE program. In addition, in return for the warheads sent to Russia, Ukraine received atomic fuel for its nuclear power stations. Military officers relieved of duty have been provided employment, and the generous support given by the United States to Ukraine has resulted in the employment of thousands of people, helping to build a strong friendship between our two nations, and generating support for the further development of free markets in Ukraine.

PANEL 1
WHAT IS THE FUTURE OF NUCLEAR ARMS CONTROL?

Chair
Maj Gen William Burns, USA (Ret)
Former Director, Arms Control and Disarmament Agency

Mr. Frank J. Gaffney Jr.
President and CEO, Center for Security Policy

Mr. Michael Krepon
President, The Henry L. Stimson Center

Dr. Alexander Pikayev
Carnegie Endowment for International Peace, Moscow

Introduction

The current prospects for strategic nuclear arms control are much different than those faced by the United States more than 20 years ago. The Strategic Arms Limitation Talks (SALT) were deteriorating in the face of the Soviet Union's invasion of Afghanistan, and a nuclear arms race spiraled upwards with little sign of abatement. Progress since that time has been truly significant. The Intermediate Range Nuclear Forces (INF) treaty eliminated an entire class of nuclear weapons, and the Strategic Arms Reduction Treaty (START) reduced deployed strategic systems. START II, which will reduce strategic arsenals to levels of 3,500 warheads, awaits Russian ratification, and preparations for negotiations are ongoing for deeper nuclear weapons reductions under START III. The history of nuclear arms reductions and the context in which they were achieved is valuable to current arms control initiatives. Just as the current prospects for START II ratification are linked to the overall state of U.S.-Russian relations, the future of strategic nuclear arms control will be defined by the geopolitical realities of the coming decades.

Arms control is not an end to itself, but rather it is one tool of many used to ensure U.S. national security and international stability. The future of nuclear arms control is driven by a number of factors such as current and projected force structures, and the proliferation of weapons of mass destruction (WMD) and their delivery vehicles. More critical, however, is the state of change of the international system. The increasing importance placed on the threat posed by sub-state and non-state actors evokes parallels to the rise of the nation-state system in the 17th century. If the changing international security structure is evolving into a period that will shed the nation-state system, what role will nuclear arms control assume within that system?

The post-cold war environment represents new opportunities and challenges for strategic nuclear arms control. Amidst uncertain prospects for negotiated reductions in strategic arms, the strategic offense-defense relationship stands at the crossroads of change. As the United States moves towards deployment of a National Missile Defense (NMD) in the coming decade, the strategic dynamic between offense-defense,

as well as the future of arms control agreements must be reevaluated.

Arms Control: The Triumph of Hope Over Experience?

One panelist offered general observations on the role and utility of arms control, with decidedly pessimistic conclusions. He observed that previous arms control failures should serve as a caution to those implementing existing, and negotiating future, arms control agreements.

The panelist suggested that three central factors contribute to the failure of arms control agreements. The first is the systematic practice of violations. This practice, in his view, was rampant throughout the U.S.-Soviet arms control relationship and continues with Russia, amongst others, in current arms control agreements. He observed that despite the United States' continued compliance with the Anti-Ballistic Missile (ABM) Treaty, Soviet and now Russian violations continue. These violations involve the number and location of interceptors, antimissile radar, and surface to air missile systems. These deliberate acts represent, in his estimate, large-scale violations of a treaty often called the cornerstone of strategic stability. This practice of deception also occurred during the implementation of the Threshold Test Ban Treaty, the INF Treaty, and currently with regard to the Chemical Weapons Convention (CWC). China and other states, he asserts, are also guilty of broad-based obfuscation regarding their international treaty commitments.

Secondly, systematic violations further reduce the value of arms control by placing asymmetrical and adverse restraints on U.S. national security. He argued that arms control often serves to lull a compliant state into a sense of false-security, blinding one to the other's violations in the pursuit of an international norm. Further, unclassified compliance reports too often obscure realities of noncompliance due to political exigencies, thereby doing a disservice to the community engaged in public policy debate.

Finally, the panelist asserted that arms control proposals are often out of touch with reality. The ability to monitor, verify and enforce arms control agreements is frequently overstated. While universality is a stated goal unto itself, the negotiation of multilateral arms control agreements often denudes the effectiveness of the regime in exchange for consensus.

The panelist questioned the ability to verify the Comprehensive Test Ban Treaty (CTBT), particularly as concerns low-yield or highly de-coupled nuclear tests. The ability to verify compliance through National Technical Means (NTM) is often constrained by the type of weapons system being monitored. NTM's capability to count intercontinental ballistic missile (ICBM) delivery systems, despite denial, deception, and concealment efforts is still far greater than its ability to monitor chemical and biological weapons, information technology or landmines agreements. The panelist remarked that the U.S. attempts to control these technologies might be better served through a reevaluation of U.S. export control policies. The reintroduction of the Coordinating Committee for Multilateral Export Controls, or a similar export control body, would be useful in harmonizing export control policies.

The panelist contended that the most effective means of controlling weapons of mass destruction (WMD) or managing the threat that they pose is to develop a unilateral defense, instead of relying on arms control agreements in the hope that they will become universal, verifiable, and effective. The panelist argued that defenses mitigate

the dangers posed by proliferating weapons and their possessors. Further, in some instances, a credible U.S. NMD and Theatre Missile Defense (TMD) abroad would alter the decision-making calculus of those considering the pursuit of WMD and their means of delivery. If the political or strategic value of weapons acquisition is limited by a credible territorial defense, the significant "guns for butter" cost trade-off and technological challenges involved may alter that calculus. This may be particularly true for impoverished states whose acquisition goals are based on the objective of threatening the United States, its allies, and their forces abroad with asymmetrical weapons.

National Missile Defense and The Future of The ABM Treaty

Another panelist argued that the United States must build and deploy defenses against ballistic missiles. That objective is impossible, he argued, within the current constraints of the ABM Treaty. The existing limitations provide no security against the plethora of states that possess or are seeking to acquire ballistic missile technology. A politically untenable scenario is one in which, under the demarcation agreement reached in New York, TMD can be used as a veritable NMD in Japan but not for defense of the U.S. homeland. The panelist contended that in order to control the threat of weapons of mass destruction the United States must make a commitment to the deployment of a sea-based anti-ballistic missile system using the Navy's Aegis assets.

From the discussion of a sea-based NMD deployment a larger debate evolved over the future of the ABM Treaty and the growing pressure for the United States to deploy an NMD. The panelists generally agreed that the growing threat posed by the number of states possessing or pursuing ballistic missile capabilities warranted the United States' development of some type of NMD. Discussion focused on the scope of NMD, what implications it might have for the future of the ABM treaty, and how it would impact relations with Russia and China. One panelist observed that even using the sea-based deployment concept, the United States would not be protected from the current array of nuclear dangers. He reiterated the need for continued progress in areas of Cooperative Threat Reduction (CTR) and nuclear force reductions. Another panelist agreed that a deployment must be sufficient to either deter or defend against the threat posed by rogue states with ballistic missile capabilities. However, a NMD with the potential to affect the U.S.-Russian strategic balance would be counterproductive to nuclear threat reduction activities, as well as prospects for revitalizing the larger bilateral relationship.

The panelist noted that NMD does not figure well into the Russian security dynamic. Due to its conventional weapons decline, and vast territorial landscape, dependence on nuclear deterrence has become more critical. He also suggested that negotiating any ABM treaty modification, such as a removal of the Article V ban on sea-based, air-based, space-based, or mobile land-based missile defense would entail U.S. concessions on Russian multiple independently targetable reentry vehicles (MIRV) capability.

Nuclear Threat Reduction: A Change In Terminology

One panelist observed that analysis and focus on the subject of strategic nuclear arms control might be best served by first reviewing the manner in which it is addressed. The notion of "nuclear arms control" evolved during arms limitation talks in

the 1970s. It was further refined in the 1980s START negotiations and was termed "nuclear arms reduction." Today, the concept might be better represented as "nuclear threat reduction" as it encompasses nuclear arms control while acknowledging that current challenges are far more significant than bilateral arms reductions alone. In the field of nuclear threat reduction, this panelist felt that the U.S. government's plans and policies needed to be reevaluated. Its current focus is neither coherent, effective, nor helpful. As U.S.-Russian arms control relations have been overshadowed by other international events. U.S. policymakers might be wise to resuscitate the relationship and develop new, cohesive, policies aimed at engaging Russia in continued nuclear threat reduction activities.

The challenges facing U.S. nuclear threat reduction policy are complex and growing. As U.S.-Russian relations have soured, the U.S-Chinese relationship has plummeted. Threat reduction in the 21st century will require the presence of stable, bilateral relationships on both of these fronts. This panelist suggested that the current administration has shifted from a first term strategy of "lead and hedge" to one of "wait and hedge," a policy that has allowed START II to languish in the Russian Duma for six years. As START II, and possibly START III, will likely affect U.S. force composition this panelist suggested that it is strategically wise to implement reductions now and not wait for retrograde Duma members. U.S. leadership is essential at this juncture in nuclear threat reduction.

The movement towards national missile defense has negatively impacted the United States' relationships with Russia and China, causing structural disrepair in the two basic elements for strategic balance – predictability and stability. The danger of a resumption of nuclear testing, in the absence of the CTBT entering-into-force, cannot be overlooked. This panelist opined that if a state were to cross the tripwire by initiating a nuclear weapons test there would be a cascade of nuclear tests, thereby considerably reducing the prospects for the CTBT's entry into force.

One area in which this panelist credited the Administration with creative progress in the face of the difficult task of nuclear threat reduction was the CTR program. However, the program is in jeopardy despite its considerable progress and the benefits accrued by both the United States and the Russian Federation. Congressional reauthorization of CTR funds is uncertain, and shortsightedness on the part of the Russian Ministry of Defense and the Foreign Ministry threatens to halt the program over issues such as taxes, privileges and immunities.

U.S. leadership, in this panelist's opinion, is crucial if progress in the area of nuclear threat reduction is to be realized. No formal treaties have been negotiated in the last six and half years. He offered that the current strategic posture, which is composed of 3,000 deployed strategic nuclear weapons at high levels of readiness, does not lend itself to stability when 70 percent of Russia's early warning system has exceeded its intended operational life span. Even without movement from the Duma on START II ratification, the United States must take the lead by reducing its current alert status, reducing current START force levels, and seeking reciprocal reductions from Russia before START II is ratified. A comprehensive dialogue with Russia is needed to discuss the new meaning of national strategic stability in a world complete with new nuclear dangers. Such a dialogue must include nuclear threat reduction, CTR

and an evaluation of the offense/defense relationship.

A Perspective On Strategic Nuclear Arms Control

A panelist offered his views on the Russian perspective of the future of strategic nuclear arms control, as well as the positions within the Duma concerning the ratification of START II. Since the collapse of the Soviet Union, the Russian Federation faces three basic challenges in the area of strategic nuclear arms control. First, the realities of the economic crisis in Russia will dictate reductions in strategic nuclear forces with or without START II ratification. The key questions remaining are how deep the reductions will be, how quickly they will occur, and the resulting Russian strategic force structure. While even traditional hard-liners have accepted the fact that maintaining strategic parity will be impossible, they perceive START II as serving to magnify the imbalance. Even if START II were ratified, economic constraints would likely mandate further reductions to a force between 1,500 and 2,500 warheads. The panelist foresaw Russian strategic forces dropping to perhaps 600-800 single warheads in the next 10-15 years, while the United States could maintain its forces at the START II ceilings of 3,500 warheads, resulting in a 6:1 imbalance. The prospect of a severe strategic imbalance has shaped the debate in the Russian Duma.

Absent START II and its restriction on MIRVs, Russia could field the same number of missiles, each with three MIRVs against a U.S. START force level of 6,000, which would reduce the imbalance to 3:1. It is this dynamic that prevented ratification of START II in January 1993 and has continued to be an element of its ongoing delay.

The second challenge facing traditional strategic nuclear arms control, from the Russian perspective, is the globalization, or horizontal proliferation of nuclear weapons and their delivery systems. Bipolarity during the cold war allowed the two major nuclear powers to ignore marginal nuclear powers and threshold nuclear states. The nuclear tests by India and Pakistan, and progress by others in developing ballistic missile capabilities, has made the nuclear equilibrium more multilateral, and increased the difficulty in negotiating formal nuclear arms control agreements.

The third challenge, which has become increasingly apparent since last year, is the deterioration of U.S.-Russian relations. The panelist offered that the issue of nuclear nonproliferation has taken on a different value for a new generation of Russian leaders. While formerly regarded as an absolute value to be sought, many now regard nuclear nonproliferation as a tool for Russia to gain concessions from the West in other key areas of Western-Russian relations. Accordingly, some, albeit a minority, regarded the nuclear tests by India and Pakistan as serving the Russian long term strategic goal regarding the emergence of multipolarity. The panelist believes that the lack of consensus on issues such as Indian-Pakistani nuclear proliferation represents a disturbing trend in the area of nonproliferation.

Nonproliferation and the Russian Duma

The recent deterioration of U.S.-Russian bilateral relations has negatively impacted nuclear arms control and nonproliferation. The panelist offered an account of how worsening relations could impact the ratification of START II, and affect progress in other areas of arms control. In the fall of 1998, under the commitment of Prime Minister Primakov's government, prospects for

START II ratification appeared sound despite reservations by some over potential strategic imbalances. An acceptable text for ratifying the agreement was drafted in December 1998 and a procedural vote was scheduled. This would have resulted in START II ratification by January 1999. However, the issue was delayed in protest over U.S. airstrikes against Iraq.

Under continued pressure from Prime Minister Primakov, the ratification process resumed when in March 1999 the Duma Council adopted a procedural decision formally requesting that President Yeltsin submit the agreed START II text for ratification. President Yeltsin submitted the text later that month, prior to Prime Minister Primakov's planned visit to the United States. However, his visit was cancelled, and the Duma asked President Yeltsin to remove the agreed text of the ratification resolution in protest over NATO airstrikes in Kosovo. Given the current hostility to the arms control agreement, the panelist felt it was unlikely that any progress would be made on START II ratification until after the Duma elections in December 1999.

The tenuous road towards START II ratification has also affected Russia's progress in other areas of arms control and threat reduction. Ratification of the CTBT was anticipated after START II, but it now appears likely that Russian ratification will not occur prior to the opening of the CTBT Special Conference in Fall, 1999. Likewise, a bilateral treaty concerning conventional confidence building measures on the borders of Russia, China, Kazakhstan, Kyrgyzstan, and Tajikistan, for which easy ratification had been anticipated, now appears difficult to attain. Delay in START II ratification may undercut the appearance of the nuclear power's commitment to arms reductions under Article VI of the NPT (Nonproliferation Treaty), and will complicate the NPT Review Conference in 2000.

The panelist argued that nuclear threat reduction has an important role in U.S.-Russian relations. The U.S.-Russian agreement on Highly Enriched Uranium will enable Russia to undertake a unilateral reduction of 20,000 tactical nuclear weapons, or nearly 40 percent of its current nuclear arsenal. The panelist noted that the only sphere of relations not seriously affected by the Kosovo conflict has been CTR assistance, with the exception of military to military contacts. He regarded the CTR program as the basis from which to resume a cooperative relationship. Cooperation between the Department of Energy and the Russian Ministry of Atomic Energy has opened dozens of nuclear complexes, resulting in increased transparency and the initiation of safety and security programs. Absent CTR assistance, Russia's ability to maintain control over nuclear materials would be seriously compromised. As such, the program should be regarded as a major success. Continuing CTR cooperation will be a likely vehicle for reconstituting U.S.-Russian bilateral relations.

In the aftermath of the cold war, the relationship between offense and defense is becoming increasingly unclear. Acknowledging that Russia will not be able to maintain nuclear parity with the United States, revisions to the ABM Treaty become more complicated. The panelist noted several Russian concerns that need to be addressed during the transition towards the U.S. deployment of a defensive system. One concern is the affect that U.S. NMD, or the deployment of TMD in Japan or Taiwan, would have on prospects for Chinese strategic nuclear buildup. He felt it likely that China would use a U.S. defensive deployment as a pretext for its sizable force

buildup, and its continued pursuit of MIRVed ICBMs (intercontinental ballistic missile) and submarine launched ballistic missile. A START II paradigm in which Russian strategic ICBM forces are ultimately reduced to 600-800 warheads could result in nuclear disparity if China sought a major buildup using MIRVs. The panelist regarded Russia's nuclear predominance over China, in light of the continued deterioration of Russian conventional forces, to be a defense priority in the Asiatic region. A key path forward in the ABM Treaty modification debate may be U.S. concessions on Russia's retention of a MIRVed ICBM capability.

Summary

The dangers posed by nuclear threats in the current security environment are far more diverse and complex than those present in the cold war dynamic. The present state of relations between the United States and Russia has soured prospects for arms control progress. Consequently, a window of opportunity now exists for a serious review of U.S. nuclear threat reduction policies. Modification of the ABM Treaty, essential for the deployment of an effective NMD, would likely engender concessions to Russia on the retention of a limited land-based MIRV capability. U.S. leadership in pursing deeper strategic nuclear reductions, whether achieved under the construct of START II or more informal bilateral arrangements, is essential to reducing nuclear dangers and signaling U.S. commitment towards continued nuclear reduction. Progress in this area will be crucial during the upcoming NPT Review Conference in 2000.

It is highly likely that progress on the CTR program will continue despite the present state of relations. The CTR program could also prove to be a vehicle for Russia re-engaging as a cooperative partner in the area of nonproliferation. Continued debate on the changing offense-defense relationship must focus on technological realities, bipartisan discussions on the true nature of the threats facing the United States and Russia, and a strategy aimed at maintaining strategic engagement with Russia while developing and evaluating missile defense deployment plans.

PANEL 2
WHAT ARE THE NEW FRONTIERS IN CONVENTIONAL ARMS CONTROL?

Chair
Dr. George Look
Principal Director for Threat Reduction Policy,
Office of the Secretary of Defense

Mr. Steven D. Goose
Human Rights Watch, Arms Division

Ambassador Lynn Hansen
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Colonel Thomas D. Miller
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Introduction

Conventional arms control involves complex multilateral dynamics and requires increased attention to meet core challenges. In the post cold war security environment, it will become increasingly important to look to the problems of conventional arms control and the prospects for future initiatives, both within and beyond the formal arms control process. Conventional arms control involves non-governmental organizations (NGO) as potential partners. Responses to the threat posed by conventional arms may include the formal treaty process, such as the Conventional Forces in Europe (CFE) Treaty, and confidence and security building measures (CSBM), like data declarations under the United Nations Conventional Arms Registry. Responses may also include a greater focus on humanitarian solutions. Policy makers must search for the appropriate mix of tools to address diverse problems. Quite often these issues, particularly in regional conflicts, stem from ethnic conflicts that add a complex dynamic to arms control discussions.

A Force Planner's View of Conventional Arms Control

The underlying premise of arms control agreements is the adversarial relationship of its partners. The frequently unlimited duration of arms control treaties may serve to perpetuate these relationships. While states use legally binding arms control agreements to limit arms and promote security, the NGO's interest in arms control is the protection of noncombatants. This panelist evaluated conventional arms control from a force planner's perspective. The cold war arms control experience was one of bilateral treaties vested with verification and enforcement provisions designed to check a growing nuclear arms race. In the aftermath of the cold war, the focus has shifted to the non-nuclear arena, such as chemical and biological weapons, and conventional arms. The treaties are multilateral in nature, such as the CFE, the Chemical Weapons Con-

vention (CWC), the Convention on Certain Conventional Weapons (CCW), and the Ottawa Convention, which bans anti-personnel landmines (APL). The panelist noted that cold war arms control successes, such as SALT (Strategic Arms Limitation Talks) and START (Strategic Arms Reduction Treaty), would be unlikely to be replicated in current agreements that do not enjoy universal membership and have significant verification challenges. He expressed concern over the U.S. policy of implementing treaties that have yet to enter into force, resulting in unnecessary limitations on operational flexibility.

The panelist noted that the growing number of conventional arms control agreements lack penalties for noncompliance, and in some cases, verification regimes. Many signatories and ratifiers of the Ottawa Convention still employ APLs, with no penalty for their noncompliance. He noted that the U.S. practices a responsible APL deployment policy that does not pose a risk to noncombatants.

From the perspective of a force planner, conventional arms control agreements can increase both confidence and transparency in the disposition of military forces. However, they also serve to increase the vulnerabilities of compliant parties vis-a-vis non-compliant states. In the absence of a credible verification and enforcement regime capable of deterring and detecting cheating, states will base their security decisions on self-interest and exploit the advantage of being a free rider to a treaty espousing an unenforceable international norm.

The panelist contended that political capital expended on the negotiation of legally binding agreements without capable verification regimes would be better spent in the pursuit of politically binding CSBMs, such the Open Skies Agreement and the United Nations Registry of Conventional Armaments. Arms control agreements must be evaluated in the warfighting context, and treaties with little likelihood of enforcement that constrain legitimate capabilities and needed operational flexibility should be avoided. The force planning perspective on arms control is to seek a balance between what is being given up and the increased security gained from a new arrangement. The CCW's efforts to ban laser-blinding weapons serves as a useful example. The panelist indicated that the use of these weapons is clearly not in the U.S. interest, but related capabilities like range-finding are essential to the force planner.

Declining force structures increase the importance of this operational flexibility. The current U.S. Air Force is 36 percent smaller than the one deployed during Desert Storm in 1991, and number of active wings is down 44 percent. As mission areas increase in number and scope, force planners depend on highly mobile and deployable forces. The panelist noted that in recent deployments to Bosnia and Kosovo the CFE Treaty slowed, and in some cases constrained, the movement of forces towards their intended peacekeeping duties, and that advanced notification of force movements required under the Vienna Document created a potential intelligence boon for Serbia. The panelist contended that neither arrangement served to aid force planners in the execution of their mission. Since the intent of the CFE was to increase confidence in an East-West security environment, negotiated ceilings on force structures and deployments did not anticipate a Kosovo-like operation.

The panelist suggested that cold war security arrangements should not be adapted to the current geopolitical environment, but rather new politically binding arrangements

focusing on transparency in military affairs should be sought. CSBMs of this vein would involve extensive data exchanges, notifications of intended military activities, and opportunities to observe exercises and units. These arrangements can reduce the probability of surprise attacks and detect covert arms transfers and buildups, while increasing confidence and establishing new traditions of military to military cooperation. CSBMs will likely play a key role in the ultimate stabilization of the Balkans and the Korean Peninsula. A key challenge in this regard is developing technologies that capture military inventories and dispositions, while providing insight into military intentions.

NATO and Arms Control

The next panelist discussed the relevance of arms control within Europe and in the larger perspective of the North Atlantic Treaty Organization (NATO) alliance. The evolving security structure of Europe involves interlocking institutions and reinforcing arms control agreements. A security model is developing to harmonize the various institutions. Stemming from the recent NATO summit, a new strategic concept has evolved. The concept specifically addresses arms control. Arms control will continue to play a major role in achieving NATO security objectives by enhancing stability at the lowest level of forces consistent with larger security obligations. The concept prioritizes the harmonization of arms control and defense objectives. In the strategic concept, the alliance is committed to the development of disarmament, arms control and nonproliferation agreements as well as to the promotion of CSBMs. One example of NATO's role in the arms control process is negotiating the CFE Treaty Adaptation.

The CFE was signed in 1990 and entered into force (EIF) in 1992. Since EIF, over 2,300 on-site inspections have occurred, and over 50,000 items of treaty-limited equipment (TLE) have been reduced. CFE remains the cornerstone of European security. However, by the time of EIF, the basis of its negotiation - an East-West bloc confrontation scenario - had changed. The numerical limitations on 5 categories of TLE were regionally defined in order to establish parity between the blocs. Consequently, adaptation of the CFE Treaty was undertaken in order to adjust restrictions in the face of major geopolitical change. The 1996 CFE Review Conference decided that an update was required. The scope and parameters of the adaptation were established the following year, and the basic elements of modification - a new system of national and territorial ceilings instead of bloc limitations – were enumerated. In June 1998, NATO members addressed these adaptations, as well as proposals for improving the verification and information exchange regimes. In March 1999, the last outstanding issues associated with adaptation were resolved, and it is likely that the treaty will be ready for signature at the Organization for Security and Cooperation in Europe (OSCE) Summit in November 1999. The panelist noted that it remains unclear to what degree the crisis in Kosovo will impact the agreement's approval.

During the height of the Balkans crisis, increased attention was directed at the Vienna Document. Approved under the auspices of the OSCE, the Vienna Document is a complex, politically binding agreement aimed at increasing transparency. Currently, a review is underway of the Vienna Document. Proposals for modification include lowering notification thresholds and the introduction of naval CSBMs. The panelist suggested the peacekeeping experience

in the Balkans might lead to a more detailed review of the transparency process.

The panelist also addressed the new frontiers for conventional arms control in the Euro-Atlantic environment. While Article V of the Dayton Agreement, which calls for sub-regional arms control, is on hold because of the Kosovo crisis, it could serve as a framework for continued threat reduction efforts. Regional arrangements could be expanded in both scope and intensity, and may be directed at the transfer of small arms and light weapons and humanitarian demining. Increasing transparency and information exchange will prove to be essential if future initiatives are to increase European security. The panelist concluded that future agreements must be clear, precise, and verifiable if they can be expected to lessen security risks.

The Future of Confidence and Security Building Measures

For nearly 20 years, the United States has played a leading role in helping create the current European security architecture. Too often however, U.S. policymakers focus only upon NATO instead of evaluating the composite makeup of interlocking agreement and alliances. The next panelist expressed concern over how the United States had recently implemented politically binding agreements in Europe, and the implications those actions may have for future CSBMs worldwide.

The Vienna Document is largely based on negotiations that took place from 1984 to 1986. The negotiated CSBMs were intended to be politically binding. These provisions were significant in that it was the first time the Soviet Union had agreed to on-site inspections. The panelist noted that on two occasions during the Kosovo crisis the United States refused Russian requests for inspections under the Vienna Document.

During the Kosovo crisis, a Russian request for an inspection of NATO troops in Macedonian under the terms of CSBMs of the Vienna Document was denied by the Supreme Allied Commander, Europe (SACEUR) on the basis that an inspection could jeopardize operational security. A second Russian inspection request was issued concerning troop deployments in Albania. While the United States again refused this request, NATO allies disagreed, and Russia inspected non-U.S. troop dispositions in Albania.

However, the United States did comply with its legally binding obligation to a CFE inspection request at Aviano Air Force Base in Italy. The panelist disagreed with the concept of operational security as a rationale for denying an inspection under a politically binding agreement, but focused his attention on the implications that the decision may have for future CSBMs and threat reduction activities. The panelist noted that the majority of states regard political and legal commitments as identical, and that a U.S. policy highlighting their distinctions is counterproductive to larger security aims.

Submitting to inspections under the CFE, but denying them under the Vienna Document has several implications in this panelist's estimation. The action tells others that the United States complies with legally but not politically binding agreements. This may damage future U.S. initiatives aimed at implementing CSBMs, such as in the Middle East where a key tenet of U.S. policy has been to press for greater CSBMs. The decision may also deprive the United States of the use of future political commitments with Russia, by signaling that these agreements are insufficient to elicit compliance. The

outcome of the CFE Treaty Adaptation may depend on political declarations and measures, thus complicating negotiations.

Further, the panelist argued that the U.S. decision will weaken or deprive the NATO alliance of the use of political declarations because others now perceive U.S. policy to be one of complying with agreements solely on a legal, not political basis. The political obligations of the Vienna Document should not be construed as voluntary if the objective of CSBMs is to reduce tension in critical situations, where denying an inspection request may result in the opposite effect. The panelist claimed that the notion of confidence building has been dealt a major blow by U.S. actions. The U.S. decision damaged leadership capability within NATO, and will increase calls for a European SACEUR, a position that has been a U.S. appointment since NATO's inception.

The future of conventional arms control in Europe is uncertain. The importance of the CFE in Europe is such that it will continue to play a major role in the future. In the aftermath of Kosovo, there will be a greater need for CSBMs in Europe. The panelist asserted that these negotiations would likely occur not within NATO but the OSCE, an organization that functions on political agreements. U.S. leadership may be seriously impinged if the basis of future agreements in this area are politically binding agreements.

A U.S. affirmation of support for politically binding CSBMs is necessary, the panelist concluded, if the United States is to maintain its leadership role within the Atlantic alliance.

The Ottawa Treaty: The New Face of Conventional Arms Control?

The last panelist framed his remarks by contending that the conventional arms control community should focus not on traditional TLE, such as tanks and jets, but on other weapons systems that also have a major impact on global security and human lives, like small arms and light weapons. The panelist advocated a need to move away from traditional arms control approaches and threat reduction tools. Arms control can be more than simply controlling an adversary's capabilities. Furthermore, he claimed that good arms control agreements do not necessarily have to be universal, verifiable, and enforceable.

The panelist drew upon the lessons learned from what he regarded as a successful experience in the attempt to eliminate APLs. The international campaign for banning APLs serves as a model for a new form of international diplomacy. The APL ban movement demonstrates that an arms control agenda can arise from humanitarian concerns. A successful arms control enterprise can be conceived and executed not by traditional great power entities, but by states of marginal geopolitical importance and NGOs. The treaty represented a true leadership partnership between smaller states and international organizations, such as the International Campaign to Ban Landmines. The formation of the treaty was far different than previous multilateral treaty negotiations. NGOs were vested with delegate status, and had access to all levels of negotiations, such as working group meetings held in an open public forum. This government and NGO partnership is the true hallmark of the Ottawa Treaty. It demonstrates that arms control progress can be made outside traditional diplomatic channels. NGO's expertise in the landmine situation earned

them a seat at the negotiating table as an equal partner.

While the Ottawa Treaty is primarily humanitarian in nature, the panelist indicated that it does contain arms control provisions. It does include an absolute, universal, prohibition on the production, stockpiling, transfer, and use of APLs in all circumstances. The treaty requires that all stockpiles be destroyed within four years after EIF, and that all APLs be removed from the ground and destroyed within 10 years. It also calls for governments to provide humanitarian assistance to landmine victims. The treaty was negotiated in just over a year, and the speed with which it is entering into force – nine months – demonstrates the high priority given to its objectives by the international community.

The treaty has been criticized because of the absence of key states such as the United States, Russia, China, India, and Pakistan. The panelist contended that, while disappointing, the absence of these states does not undercut the importance of the treaty. He indicated that the true targets of the treaty were not states like the United States and China, but states where landmines are traditionally deployed with substantial humanitarian cost, such as Mozambique and Cambodia. With few exceptions, the major users of APL have acceded to the treaty. Furthermore, eight of the 12 largest producers and exporters of landmines have signed the Ottawa Treaty. The panelist noted that while significant work in the area of universality still lies ahead, the current disposition of states parties will have an immediate impact on reducing the humanitarian risk posed by landmines.

One area of significance in the Ottawa Treaty has been the formation of a Landmine Monitor System – a NGO run, quasi-verification organization used to track progress and problems associated with the international ban on APLs. The intent of this System is to attempt to hold states accountable to the Ottawa Treaty obligations using interviews, investigative research, and case studies, instead of more traditional verification measures like national technical means and on-site inspections. The System includes a worldwide network of researchers and a public-access database containing information about the current state of implementation.

The System is significant in that it represents the first time that civil society has played a coordinated, systematic, and sustained role in the monitoring of the implementation of an arms control or humanitarian agreement. The NGO's monitoring role may serve as a useful precedent in future agreements, the panelist contended.

The lessons learned from the movement to ban APLs are being applied to campaigns against other weapons systems. A related initiative is the campaign to ban blinding laser weapons. A number of international NGOs have worked closely with governments to produce the 1995 Laser Protocol to the CCW. The Ottawa Treaty represents the first time that a widely deployed weapons system was banned and codified by an international treaty norm. The Laser Protocol, although admittedly filled with loopholes, is an attempt to ban a weapon system that has yet to be widely deployed.

A number of humanitarian campaigns have emerged that are attempting to capitalize on the successes of the landmine ban movement. Examples include efforts related to small arms and light weapons.

While the panelist recognized that a ban on these weapons would be unachievable, the initiative's aims are focused at lim-

iting their proliferation, promoting transparency, and destroying excess weapons stocks. The panelist noted that one future area of focus for NATO might be the final disposition of Soviet-era weapons held by new NATO members. As a condition of NATO membership and system interoperability, new members would abandon many of their small arms and light weapons stockpiles, weapons still widely valued on the international market. As for emerging weapons systems, attention should be focused at directed energy weapons – such as acoustic weapons and microwave weapons. The panelist indicated that greater transparency is required in these areas to determine if these systems, labeled by many as non-lethal weapons – are consistent with humanitarian laws and concerns.

The panelist surmised that the global changes that have occurred in the post-cold war period were responsible for the success of the landmine ban movement. This new security environment should enable policy makers to explore the nexus between humanitarian concerns and arms control issues, to focus on smaller conventional weapons systems, and finally, to recognize the role of civil society in both humanitarian and national security issues.

Summary

As prospects for a major power confrontation remain low, increased attention must be directed at the challenge of conventional arms control. Within a regional conflict, these arms can prove as destabilizing and destructive as WMD systems that often receive greater focus. Many agreements aimed at reducing the conventional threat will use politically binding CSBMs. Accordingly, a U.S. commitment to these practices is essential. The conventional arms control frontier will also see greater involvement from NGOs, as demonstrated by the Ottawa Treaty Process. Policy makers must seek to work in a cooperative relationship with these organizations to achieve the mutual aim of increasing global security. However, one should not loose sight of the force-planning dynamic. Arms control must be evaluated in a larger national security context, so that the tools available to the force planner will be sufficient to address any challenge they might face.

DINNER SPEECH BY
ADMIRAL RICHARD W. MIES
Commander-in-Chief, U.S. Strategic Command

Dr. Davis, Ambassador Goodby, Ambassador Brooks, Admiral Chiles, fellow flag officers, distinguished guests, ladies and gentlemen, I am indeed honored to address such a distinguished gathering of international leaders and arms control experts.

In this world of increasingly diverse threats and great uncertainty, it is critically important for this international community to remain engaged in a meaningful arms control dialogue. Tonight I would like to share some of my perspectives on our strategic nuclear policy and force structure and our progress in arms control.

Before I begin let me tell you a brief anecdote – some of you may have heard me tell this one before. My wife recently gave me an anniversary card. On the cover it said, "You're the answer to my prayers." However, when I opened it I was surprised to read: "But you're not what I prayed for." We don't always get what we pray for.

Deterrence of aggression and coercion is a cornerstone of our national security strategy. Our strategic nuclear forces serve as the most visible and important element of our commitment to this principle. Although the risk of massive nuclear attack has decreased significantly and the role of nuclear weapons in our national military strategy has diminished, deterrence of major military attack on the United States and its allies, especially attacks involving weapons of mass destruction, remains our highest defense priority. Our national security strategy reaffirms that:

"Nuclear weapons serve as a hedge against an uncertain future, a guarantee of our security commitments to allies and a disincentive to those who would contemplate developing or otherwise acquiring their own nuclear weapons."

Although the cold war has ended, there remain a number of potentially serious threats to our national security including regional dangers, asymmetric challenges, transnational threats, and "wild cards."

Russia still possesses and continues to modernize its substantial strategic and non-strategic nuclear forces. Although Russia has made great progress toward creation of a stable democracy, that transition is not assured. Hence our strategic forces serve as a hedge against the possibility of Russia's reemergence as a threat to the United States and its allies.

Today, China possesses a much smaller nuclear force than we have. Nevertheless, China is modernizing its strategic forces and we cannot discount its emergence as a potential threat.

The proliferation of weapons of mass destruction and their means of delivery pose the greatest threat to global stability and security and the greatest challenge to strategic deterrence. The issue may not be <u>whether</u> weapons of mass destruction will be used against the West by a rogue nation or transnational actor, but <u>where and when</u>.

Accordingly, U.S. Strategic Command's present mission – "To deter major military attack on the United States and its allies, and, if deterrence fails, employ forces" – reflects continuity with the past while addressing current challenges such as providing expertise and support to the geographic CINCs [Commander-in-Chief] to help counter the proliferation of weapons of mass destruction and the means of their delivery.

From an historical perspective, the end of the cold war has brought dramatic change to our strategic forces. Cooperative threat reduction, arms control, presidential initiatives, and numerous confidence-building measures have brought about many positive developments in the strategic postures of the United States and Russia. These changes reflect a new, constructive relationship between our nations – a relationship in which stability is a central consideration. Stability is the most important criterion as we proceed down the glide slope to lower numbers of nuclear weapons. As one of my college professors, Thomas Schelling, has written:

"The dimension of 'strength' is an important one, but so is the dimension of 'stability' – the assurance against being caught by surprise, the safety in waiting, the absence of a premium on jumping the gun."

Control of our glide path is critical – the journey is just as important – probably more important – than the ultimate destination.

Both countries agree that the stability of our relationship must be preserved so that neither state fears the other will achieve a strategic advantage. And although progress is presently stalled by events in the Balkans and economic and political problems within Russia, I believe we remain on a well thought-out course, a course that is stable, verifiable, and reciprocal. At the same time, both countries continue to rely on the unique deterrent value provided by nuclear weapons. As I've already indicated, the United States has acknowledged that nuclear weapons play a diminished but essential role in its national security strategy.

In contrast, Russia has stated that due to the deterioration of their conventional forces and the severe economic turmoil confronting their nation, nuclear weapons will play a more important role in deterring attack on their country in the future. As but one example, they have recently recanted their no first use policy. Ironically, this action mirrors that of NATO during the cold war when it was confronted with similar fiscal constraints and shortcomings in its conventional capabilities.

With the end of the cold war, the United States has dramatically changed its strategic force posture. Our forces no longer target other countries during normal peacetime operations. Our strategic bombers and their supporting tankers have not been on alert since 1991. Our strategic submarine force, while positioned at sea for survivability, patrols under more relaxed conditions of alert. Since 1990 we have also made dramatic progress in reducing our nuclear arsenal and associated infrastructure. We have:

- Halted production of the B-2 bomber and converted the B-1 bomber to conventional only use;
- Eliminated the Minuteman II intercontinental ballistic missile (ICBM);
- Eliminated all ground-launched intermediate-range and short-range nuclear weapons;

- Removed all sea-launched nuclear cruise missiles from ships and submarines;

- Eliminated all nuclear short-range attack missiles from the bomber force;

- Reduced the number of command and control aircraft from nearly 60 to 20.

All of these changes reflect a consistent trend towards reduced reliance on strategic systems. Since the end of the cold war we have reduced our strategic nuclear systems by over 50 percent and non-strategic nuclear systems by over 75 percent. We have reduced the number of people involved in our strategic forces by approximately one-half and the number of military bases supporting them by approximately 60 percent. While overall defense spending has declined roughly 11 percent since the end of the cold war, strategic force spending has declined roughly 70 percent; as a consequence, strategic force costs have dropped from eight percent of DoD [Department of Defense] total obligation authority in 1990 to less than three percent today. That in my mind is a pretty good "peace dividend" and a cost-effective premium on our Nation's "ultimate insurance policy."

To deter a broad range of threats, our national security strategy will continue to require a robust triad of strategic forces. Both the Nuclear Posture Review and Quadrennial Defense Review have reaffirmed the wisdom of preserving the complementary strategic triad of land-based intercontinental ballistic missiles, submarine-launched ballistic missiles, and strategic bombers. Each leg of the triad contributes unique attributes that enhance deterrence and reduce risk; intercontinental ballistic missiles provide prompt response, submarines provide survivability, and bombers provide flexibility. Together they comprise a robust deterrent that complicates any potential adversary's offensive and defensive planning. The triad is also a synergistic force that provides protection against the failure of a single leg. I do not see this changing even at levels approaching START III [Strategic Arms Reduction Treaty].

Today we have no new strategic systems under development. With the exception of the Trident D5 missile, which will complete its production run in 2005, the United States has in-hand all of its major strategic systems. Therefore, as our nation comes to rely on a smaller strategic force, the imperative for modernizing and sustaining that force becomes even more critical to ensure a continued viable deterrent. And since we must maintain these existing systems for the foreseeable future, it is also crucial to sustain the industrial base that provides key components and systems unique to our strategic forces.

As I indicated earlier, our progress in further bilateral reductions has been stalled by the Russian Duma's failure to ratify START II. As a result, we have a congressional mandate to maintain our strategic forces at START I levels. At the same time, the Trident I, C4 missile is already beyond its design service life and can only be sustained at substantial cost and considerable risk to the middle of the next decade. Consequently, we have recently sought congressional permission to transition the Trident submarine force from an 18-boat, mixed-missile force to a 14-boat all-Trident II missile force. Backfit of four Trident submarines to carry the D5 missile is considered the most cost-effective means to ensure a reliable sea-based deterrent well into the next century. In my estimation, a modernized 14-boat, all D5 missile force is in many ways a more robust, credible, and reliable deterrent than the present 18-boat force.

While we have undertaken the modernization of the undersea leg, the Secretary of Defense has committed to maintain the Peacekeeper ICBM fully operational for an indefinite period. Peacekeeper, which is planned for retirement under START II, is being retained on a year-to-year basis as leverage to encourage the Russian Duma to ratify START II and eliminate all multiple warhead ICBMs which are considered the most destabilizing of all strategic weapons.

As you might expect, with START II apparently stalled, there have also been many calls for unilateral actions on our part to further reduce our forces or reduce our alert rates.

While I am not opposed to sensible unilateral reductions such as the Trident modernization, I believe considerable caution should be exercised in unilaterally reducing our strategic forces below the negotiated START I force levels until it is evident that Russia is fully committed to further arms control reductions. Proceeding unilaterally with START II reductions, in the hope that Russia will follow, could remove Russia's incentive to ratify the START II treaty and potentially jeopardize our strategic stability.

Additionally, because we have neither new delivery platforms nor new warheads in development, we must not be hasty in taking irreversible steps to reduce our capability or flexibility. While elimination of platforms may be particularly appealing to some, the trade-off is usually a loss of flexibility and an increase in vulnerability. Again, the stability of our force posture is critical.

Similarly, reducing the alert status of our forces, in isolation, can diminish the credibility and survivability of our deterrent forces. Many de-alerting proposals jeopardize the existing stability against a preemptive first strike because they increase our vulnerability and create a premium for attacking first. As Albert Wohlstetter wrote many years ago: "Relaxation of tensions, which everyone thinks is good, is not easily distinguished from relaxing one's guard, which everyone thinks is bad."

Most de-alerting proposals create an incentive to be the first to rearm. Like the railroad mobilization dilemma of World War I, any unilateral act to restore de-alerted assets, or any act which might be perceived as restoring de-alerted forces, creates a potential for instability. If a de-alerting initiative can relax tension and not create a perception that a strategic advantage could be gained by a preemptive strike, I believe our National Command Authority would support it. But, in general, de-alerting initiatives should not be adopted unless they are reciprocative, verifiable, and, most important, stabilizing.

I would also like to challenge those who routinely characterize our forces as being on "hair-trigger" alert – a characterization routinely used to justify de-alerting proposals. Multiple, stringent procedural and technical safeguards have been in place, and remain in place, to guard against accidental or inadvertent launch. Rigorous safeguards exist to ensure the highest levels of nuclear weapons safety, security, reliability, and command and control. Additionally, the policy of the United States is not to rely on "launch on warning." Deterrence depends not on a capability to strike first, but as Albert Wohlstetter noted, "the capability to strike second." Our forces are postured such that while we have the capability to respond promptly to any attack, we do not need to rely upon "launch on warning" or "launch under attack." The flexibility, survivability, and diversity of our strategic forces and our

command and control networks are designed to ensure we are always capable of an assured retaliatory response. As Thomas Schelling has said:

"If both sides have weapons that need not go first to avoid their own destruction so that neither side can gain great advantage in jumping the gun and each is aware the other cannot, it will be a good deal harder to get a war started. Both sides can afford the risk: when in doubt, wait."

Our trigger is built so we can always wait – the hair-trigger characterization is an unfair one.

Returning to START – if the Russian Duma ratifies START II and the treaty enters into force, we are prepared to move towards a force of 3000-3500 accountable weapons in a deliberate, prudent manner and, as agreed by Presidents Clinton and Yeltsin at Helsinki, we are also prepared to negotiate even further reductions under START III.

I believe further reductions in strategic delivery systems beyond START III need to be complemented by more comprehensive considerations of increased stockpile transparency, greater accountability of tactical nuclear warheads, limitations on production infrastructures, third-party nuclear weapon stockpiles, the impact on our allies, and the implications of deploying strategic defensive systems.

Let me speak for just a moment on strategic defenses. The proliferation of weapons of mass destruction and the proliferation of ballistic missile technology, as reflected in the Rumsfeld Report, have generated strong interest in theater and national missile defense. The ABM [Antiballistic Missile] Treaty remains the most significant obstacle to deployment of a national missile defense system. As you know, many people, like Henry Kissinger, believe the ABM Treaty is a cold war relic negotiated under circumstances which are far different from today's situation. In a multi-polar world of greater uncertainty and more diverse threats, I believe that some form of strategic defense is both appropriate and inevitable, but I also believe it should be part of a comprehensive deterrence policy that takes into consideration not just the threat, but also the cost effectiveness and operational effectiveness of the defensive system and the impact of any deployment on our allies, our potential adversaries, and our arms control agreements.

Russia is not immune from the dangers of proliferation – in fact, she is surrounded by them – and a collaborative approach to modification of the ABM Treaty and missile defense might be in our mutual national interests.

Arms control must be viewed as a means to an end – national security – and not as an end in and of itself. There is often a tendency in arms control to focus on numerical limitations, to seek agreements for their own sake, and to avoid issues simply because they make agreements more difficult. But, as we reduce our strategic delivery systems to lower levels, parity in numbers alone becomes less and less important – issues such as transparency, irreversibility, production capacity, aggregate warhead inventories, and verifiability become more and more significant. It is the character and the posture of our strategic forces, more than their numbers, that makes the strategic environment stable or unstable. Stability is the most important criterion in assessing prospective arms control measures.

One final thought: since the end of World War II, the presence of nuclear weapons has had a great restraining effect.

Short of universal brain surgery, the design of nuclear weapons cannot be disinvented or or erased from memory. Even if nuclear weapons could be eliminated, asymmetrical differences in the ability to rearm could be destabilizing. As Sir Michael Quinlan has stated: "The absence of war between advanced states is a key success. We must seek to perpetuate it. Weapons are instrumental and secondary; the basic aim is to avoid war. Better a world with nuclear weapons but no major war, than one with major war but no nuclear weapons."

In closing, our strategic forces stand as America's "ultimate insurance policy" – a cost effective force which is the underpinning of our national security strategy. U.S. Strategic Command is committed to ensuring a viable deterrent for the nation, and to maintaining and strengthening the stability of our strategic relationships as we further reduce our forces – Peace *is Our Profession.*

We, like you, are committed to making this a safer world. Because, like my wife's anniversary card, the world we pray for, may not be the one we get.

Thank you.

PANEL 3
EMERGING TECHNOLOGIES — SHOULD THEY BE CONTROLLED?

Chair
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Mr. Bruce MacDonald
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Dr. Dmitri Vladimirovich Spirin
Permanent Mission of the Russian Federation to the United Nations

Dr. Kent G. Stansberry
Deputy Director, OUSD (A&T)/ACI&C

Introduction

Any discussion regarding controlling emerging technologies should begin with a global perspective before becoming more narrowly focused. In October, 1998, Dr. Hamre, the Deputy Secretary of Defense, correctly set the tone when discussing the Defense Threat Reduction Agency's (DTRA) focus on reducing the threat of weapons of mass destruction (WMD). He noted that political and economic realities are critical to developing new technologies and new means of warfare. In this context, a distinction must be made between information warfare and conflict in the information age.

National Security in the Information Age

The first panelist to speak noted that there is still no clear understanding of what comprises national security in the information age. Only a small part of this complex interaction is understood. The Office of the Secretary of Defense Net Assessment has promulgated the notion that the Revolution in Military Affairs (RMA) has occurred and continues to evolve. There is no one event that creates an RMA; neither technology nor doctrine at the end of the cold war are responsible for the current RMA. Once an organization has been established to address RMA issues, analysis must be undertaken to determine the best approach to protecting national security in the information age. Both national defense and the military's role will be different in the information age than they were in the industrial age.

One must focus on the elements of U.S. national power as they are shaped by the arenas of competition, crisis, and conflict to understand how to protect national security. The elements of national power are no longer limited to the traditional economic, political, and military but also include information. The arenas of competition and conflict affect all four elements of national power.

National security in the information age should be examined not only from the social, cultural, and economic perspectives but should also be viewed from the perspective of the military and information arenas. This concept is non-linear and is based on non-deterministic models, involving human input. Human recognition of the emergence of the information age is, in fact, fairly new. The panelist noted that the technologies affecting the information age are not limited to computer networks, satellite communications, or the Internet but rather are the fundamental technologies involved in making organizations work and influencing decision making. The panelist opined that the implications of the emerging world connectivity are not yet fully understood. In fact, the full impact of the information age on the U.S. economic, political, military, and information elements of national power is not yet fully understood.

There are five requirements that must be met before effective arms control can be conducted: 1) there must be a high cost associated with the controlled items; 2) unique materials are required that can be identified and controlled; 3) national involvement; 4) an unambiguous source for the controlled item; and 5) a single purpose for the controlled item. None of these requirements exist yet for information operations (IO) and information warfare (IW). IO/IW is a grand strategy, an orchestration of different elements that are put together in order to accomplish a common purpose rather than a series of disparate elements.

In the past, it was thought that the way to enhance national security was to destroy the enemy's military capability. As part of this effort electronic warfare; command, control, communications, computers, and intelligence; and operations security were used as force multipliers. In the information age the mindset needs to shift from having separate elements to tying all of the elements together to form "command and control warfare." By further adding the resources of the entire national government and national businesses to the existing security elements, national security in the information age emerges.

By examining the composition of this concept more closely, however, the focus turns to global security in the information age and the use of information operations to enhance that security. For the vast majority of an IO campaign, there is no way that traditional arms control measures can be effective. Therefore, the focus should be on developing capabilities that can meet the five arms control requirements rather than focusing on warfare in the information age.

In the information age arms control may focus less on the transfer of technology and more on the transfer of knowledge. A fundamental shift in the nature of technology, building knowledge as opposed to building infrastructure, is now occurring. The whole notion of knowledge transfer focuses on the multi-use of technology. Technologies are making future arms control more difficult. However, arms control can continue to play a significant role if it is appropriately integrated into the information age.

Political Aspects of Challenges to National Security in the Information Age

Another panelist noted that mankind is currently going through a stage of scientific and technological revolution as a result of the rapid development and application of information technologies and telecommunication. The information revolution provides opportunities for expanding mankind's creative potential. It also opens favorable prospects for rapid development of civiliza-

tion. A single, global information space is now emerging as a "global development factory" and is determining the main trends of social progress. Information is quickly becoming a state's major strategic resource.

Revolutionary advancements in information have brought with them many opportunities. However, they have also brought the threat of information being used for purposes that are incompatible with maintaining peace and stability. Preventive measures need to be taken to counter this threat at an early stage before it potentially leads to a scientific and technological arms race.

Information technology is diffusing into virtually all areas that support modern economies, including the military, and communications and control systems. This type of technology can also be applied to information warfare, defined as a nation's ability to damage the resources and disrupt the electronic commerce of another nation while at the same time protecting its own infrastructure. Weapons of information warfare can be used without a declaration of war and obvious preparations, and may be used by terrorists. It is extremely difficult to respond to this type of aggression because there are no existing response measures. The emergence of information weapons is due in part to the vulnerability of large amounts of public information. Although no exact definition has yet been applied to information weapons, the damage they can cause is comparable to that of weapons of mass destruction. One of the reasons why an exact definition of information weapons is still lacking is that the bulk of information technologies are of dual or non-military application.

There is a real threat that the whole system of bilateral arms control agreements will be seriously tested by information warfare capabilities. International laws do not exist to limit use of information weapons. The panelist believes that there is now an objective need to legally regulate the use of these weapons. The time has come for the topic of international information security to be substantively addressed in wide-scale international discussions to include the United Nations. This topic is critical to the strategic interests of both the United States and Russia.

Discussions on limiting information weapons should address ceasing the production of particularly dangerous weapons and their methods of use. In addition, a possible nonproliferation regime for information weapons could be created. Anti-terrorist efforts could include adopting international norms to protect resources and restrict use for aggressive purposes. It might also be extremely useful to establish an international monitoring body for information technologies. Fundamentally new thinking is needed to address limiting the use and development of information technologies.

Negotiating an international regime to limit information technologies might have some potential. Developing a completely secure information network would, in fact, be in the interest of the United States. Such a regime would rely on services that are not yet available but that show potential for development, such as an interoperable, global key management structure that would allow asymmetric cryptography to be used and authenticated. This regime would not require an international body to run it but would rely on a high degree of interoperability. However, the fact that sovereignty and national security interests would need to be sacrificed to successfully create such a regime would likely make it politically unacceptable. While government leadership is essential in establishing an in-

ternational regime, private sector cooperation is both necessary for its success and increases the difficulty of achieving such a regime. These difficulties may be alleviated by the government-private sector cooperation that is required to overcome the Year 2000 threat.

Emerging Technologies and the Future of Arms Control

Arms control is but one element of a broader set of tools used to strengthen national security. National security is also promoted through military force structures and force employment, military doctrine and strategy, diplomacy, and economic and other forms of engagement. Another panelist noted that no one element is sufficient to solve all national security problems.

Before determining how to control new technologies, the issue of whether or not emerging technologies can be controlled must first be examined. It will be more difficult than in the past to control emerging technologies. Technology trends are, in fact, adverse to arms control for a number of reasons. First, technology developments are increasingly taking place in the private sector, which complicates arms control. Second, the increased use of dual-use technologies in security structures means that many of the technologies lend themselves to broader application. Third is the proliferation of technical capabilities resulting from the involvement of a diffuse set of developers. This decentralization, and its accompanying lack of strong government control, is blurring the boundaries between nation-states and multi-national corporations. Fourth, is the proliferation of strategic destructive capabilities, which are often sought by terrorist groups to achieve their objectives. This destructive proliferation is complicated by sub-national organizations that are exploiting strategic intelligence capabilities by "hacking" into existing information sources. Central governments are becoming increasingly constrained in their ability to control these activities. Fifth is the proliferation of strategic decision-making authority; an example of this is the Internet campaign that led to adopting controls on landmines. Sixth, and finally, is the trend toward greater miniaturization as the engine of change. This leads to an organizing principle that differs from past approaches. These technology trends expose the interdependent nature of vulnerabilities. The business of defining this interdependency is still unclear.

Controllable technologies tend to share certain characteristics. Emerging technologies that can be controlled tend to include technologies whose development or deployment is so difficult and expensive that they can only be mastered by a few countries; so visible that they can be detected; so unambiguous that their development or deployment would be immediately apparent; and so compelling that all parties would agree to control them. Unfortunately, current trends in emerging technologies are running counter to virtually all of these characteristics.

A number of new technologies are emerging with implications for national security – cyber operations, infrastructure protection, biological and space warfare, national missile defense, and nanotechnology and microsystems. The threat posed by cyber operations is quite high. Hackers or terrorists may use the connectivity of the global information structure in carrying out their malicious activities on a broad, even global scale. Cyber weapons offer the opportunity for "more bang for the buck," where a small number of people can have a global impact. The low development cost

means that barriers to entry into this arena are much less than for other forms of weaponry. In addition, development facilities are not readily detectable, are very ambiguous in nature, and the malicious computer code developed therein may be nearly impossible to trace. Proliferation of cyber weapons is in fact, "just a mouse click away."

Based on the primary characteristics of cyber operations, traditional arms control methods will be nearly impossible to implement. However, arms control in this area may be promoted through confidence building and transparency measures. Arms control measures could also be assisted by information sharing and monitoring, assistance in tracing back attacks, and establishing an information-sharing center. However, such measures would likely be opposed due to privacy concerns. Increasing public awareness of the vulnerabilities associated with use of the Internet might help alleviate this somewhat. The panelist opined that increased vulnerability awareness on the part of both the government and the public, as well as government support of the private sector may be useful in developing a response to these vulnerabilities.

Along with cyber operations, increased reliance on defensive capabilities will bring with it a host of arms control considerations. The possibility exists that, in the future, emphasis may shift from offense to defense. This would result in the deployment of a national missile defense. Maintaining a balance in an offense-defense mixed environment will be very challenging. Arms control could contribute to this environment operationally by preserving stability as defenses are phased in and developmentally by preserving defensive capabilities against evolving offensive threats.

In an era of national missile defense of some kind, the level of defense will depend on the nature of the threat. Countermeasures to defensive measures could include blinding, spoofing, hiding, hardening, evasion through measures like fast burn, saturation (through use of elements like submunitions), circumvention, and suppression. Determining whether or not arms control will be able to constrain countermeasures in this environment raises a number of interesting issues. In order to be effective, arms control measures would first need to pose an acceptable burden on other equities such as offensive forces and satellites. Defining suitable restrictions on the countermeasures would also be needed. In particular, countermeasures would have to be monitorable and controllable for arms control to be effective; greater encryption would pose difficulties in this area. Such measures would also have to be negotiable. Based on these factors, there does appear to be some potential for arms control measures to be implemented in a defensive environment.

Efforts to control countermeasure technologies could be effective to the extent that such technologies are launched into space or tested in visible ways. Several trends are, however, running counter to effective implementation of such controls. With commercialization of space launch capabilities now occurring, the number of players in this field is growing. In addition, space is increasingly being used for scientific and commercial purposes, including the equivalent of submunition dispersal through "micro-satellites." Also, the measure/countermeasure game in spoofing and decoying sensors is notoriously hard to control.

Within this context, arms control is clearly limited in its ability to address emerging technologies. This limitation is offset, however, by the role played by the other factors that contribute to national secu-

rity – military force structure and force employment, doctrine and strategy, diplomacy, and economic and other forms of engagement. In addition, despite the aforementioned challenges, arms control still has an important – though more limited – role to play in future security planning with emerging technologies. It is a challenge to the arms control community to develop the appropriate ways to respond to the emerging, rapidly evolving environment.

Could Emerging Technologies Be Controlled?

In examining the nature of arms control regarding emerging technologies, an analysis of traditional arms control – arrangements negotiated and agreed to between nation-states and implemented as legal obligations – proves to be extremely useful. Another panelist noted that trying to control information and other emerging technologies with traditional arms control would be extremely difficult to accomplish.

Emerging technologies include a number of elements other than just information technology and its consequences. Emerging technologies may be found in space applications, which include supporting earth based weapons applications; missile defense, such as anti-satellite (ASAT) weaponry; precision weaponry; and nuclear weapons.

In order to be successful, traditional arms control measures must fundamentally enhance security and be in the political and objective self-interest of all parties. From these fundamental requirements, some derivative, practical requirements can be identified. For example, in order to be a shared mutual interest arms control must promote global equality among the participants, perhaps by compensating for their individual inequalities. In addition, effective verification remains a unique and crucial requirement for successful arms control. Finally, arms control should avoid being a source of additional conflict.

These requirements can be applied to ASAT warfare and information technology. ASAT arms control has been pursued off and on for more than twenty years. One of the problems associated with ASAT arms control is the need to concretely define the elements to be controlled. Problems exist in that this definition can be either too wide or too narrow. This definitional problem is exacerbated by the fact that ASAT weapons can be pursued under the guise of other capabilities. However, definitions and the scope of arms control agreements are essential for the successful application of those agreements. Verification activities would have to be extremely intrusive to clearly identify activities covered under a broad and ill-defined agreement. Requirements for secrecy associated with space activity would run counter to this requirement. The contradiction between the need for intrusive verification measures and the need for secrecy make effective implementation of an agreement nearly impossible. As a result, it becomes incumbent upon parties with satellites to adequately protect those satellites unilaterally.

Problems associated with potential arms control applications for information warfare are starker than those associated with ASAT weapons. The issue of information assurance vice information security must be taken into consideration. In addition, difficulties particularly exist in defining the technologies and information that are to be limited and identifying the boundary between military and private activity. Another problem with information warfare arms control is that the weapons themselves can be developed and tested in complete se-

crecy. The consequences of developing information weapons would only be fully understood during their employment. Nations should attempt to unilaterally limit their vulnerability to attack by information weapons. In this context, the development of adequate countermeasures may become one of the most important assets of the information age. Overall, traditional arms control does not offer much hope for limiting threats to national security posed by emerging technologies.

Summary

The panelists all agreed upon the difficulty and importance of applying arms control to emerging technologies. However, there were varying opinions on the probability of success. While emerging technologies may have opened a Pandora's box, the net effect of information technology, RMA, and increased global connectivity is that the box may remain ajar.

Some panelists proposed that transparency and confidence building measures might offer some solution to the negative aspects of the proliferation of emerging technologies. Others proposed that arms control for emerging technologies would only work if they do not harm national security and they serve the mutual interests of all the participants. The future of controlling emerging technologies is an amalgam of both approaches. While nations cannot be compelled to work against their own security and self-interests, they can be enticed to provide more transparency into their activities and thereby increase confidence in their benign intent.

PANEL 4
DUAL USE TECHNOLOGY — CAN ITS TRANSFER AND EXPORT BE CONTROLLED?

Chair
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Dr. Gary Bertsch
Director of The Center for International Trade and Security, University of Georgia

Mr. Michael Moodie
President, Chemical and Biological Arms Control Institute

Dr. Alan P. Zelicoff
Senior Scientist, Center for National Security and Arms Control, Sandia National Laboratory

Introduction

Economic and security priorities are often at odds. Nowhere is the concept and dilemma of dual-use technology more apparent than in the field of biotechnology. While biotechnology offers great benefit it is accompanied by significant risk of misuse. There is a growing recognition that biotechnology may be the defining scientific breakthrough of the coming century. The level of discovery and excitement within biotechnology is higher than in any field, as its potential is such that it could affect all fundamental processes of life. Its applications in health and food production are extraordinary, but accompanying that recognition is an acknowledgement of the potential for abuse. Every major area of scientific discovery has seen both benign and malign uses. As such, the key challenge in the coming decades is to ensure that the benefits stemming from biotechnology are neither matched nor overshadowed by nefarious or destructive applications.

One key element of U.S. national security policy is export controls and their ability to control dual use technology. The panel explored the efficiency and efficacy of export controls for addressing the problems posed by dual use technologies in general and biotechnology in particular. It also discussed the need to discover a reasonable balance between the open exploration of this rapidly diffusing technology and the mechanisms required to control its dangerous potential.

The Challenge of Export Controls

The first panelist framed the discussion of biotechnology export control with a broad overview of current policies. Two key points are central to this discussion. Although current export controls are lacking, limitations do not justify their abandonment. More importantly, changing geopolitical realities and technological developments mandate that cold war-based export control policy be modified. If the United

States is to meet the challenge of controlling the spread of weapons of mass destruction (WMD) in the 21st century, a fundamental reevaluation of current export control policies is required. Export controls will not solve this problem independently, but are one tool of many.

Export controls are laws and regulations that help deny proscribed items to undesirable end-users. In a multilateral setting, they also aid in the development of international norms. The objective of the U.S. export control policy should be to press for multilateral adherence to export control regimes, such as the Missile Technology Control Regime or others established by supplier groups like the Nuclear Supplier Group (NSG), and the Australia Group (AG). The panelist noted that the basic of laws of supply and demand would increase the critical importance of export controls in the coming decade. Further, while U.S. export control laws are the most successful of any country, its system must improve.

The panelist regarded export controls as being the most cost-effective program for national security in the aftermath of World War II. Both the NSG and the Coordinating Committee for Multilateral Export Controls are demonstrative of the success of export controls during the cold war. However, the current international security framework is far more complex, involving a growing number of proliferant states. Varying domestic and international political and economic concerns further complicates the process of harmonizing export control policies. Consequently, the implementation of export controls must be undertaken differently.

Despite the success of export controls there are notable failures; these include Western support for Iraq in the 1980s and nonproliferation violations in the former Soviet Union and China. It remains unclear how the United States will address export controls in the coming decades. The panelist offered the perspective that the United States' cold war export control experience may have been one of attempting to control too much instead of focusing on areas that can be affected.

Export Controls in Russia and China

The economic stagnation and political uncertainty in Russia creates a difficult situation for the imposition of stringent export controls. These uncertainties coupled with massive dual-use technology capabilities, scientific expertise, and a dangerous WMD surplus represents a major proliferation risk. He noted that the Cooperative Threat Reduction (CTR) program made significant progress in reducing this risk. While successes have been achieved, major challenges lie ahead. The level of funding, staffing, and political commitment within Russia is insufficient to achieve comprehensive controls. The economic incentives for corruption and the absence of a "nonproliferation culture" needs to be addressed if Russia is to effectively stem the flow of weapons, technology, and expertise that are so widely sought.

China's rapid economic growth, in the absence of strong central control, is not conducive to the control of militarily relevant exports. One challenge is the surge in military expenditures by the People's Liberation Army, which bolsters defense allocations with arms sales abroad. The panelist noted that as China seeks to regain control of regional economic growth, a window of opportunity may exist for the United States to influence China's nonproliferation attitudes and policies.

The panelist noted that the United States must use its cold war experience, available resources, and scientific and bu-

reaucratic expertise to lead others in the development of export controls capable of responding to current security realities. Current policies do not appear driven, in his estimation, by a cohesive strategy. The Export Administration Act, approved during the cold war, has expired and the current export control system is sustained by emergency legislation. The absence of a current U.S. export control law has decreased the legitimacy of U.S. calls for greater control of Russian and Chinese exports.

The promulgation of a new export control law would be a critical first step towards leading and assisting other states in establishing export controls. Further, the relationship between government and business must be strengthened, and business should be reassured that export controls are an element of a cooperative relationship and not an additional regulatory burden. A successful export control policy is one that recognizes the truly economic proportions of the problem and seeks to engage government, business, and science in a cooperative framework at an international level.

U.S. action on export controls in the coming years will have major ramifications in future decades.

Developing States and Export Controls

The next panelist noted that, just as the international security environment has witnessed sea changes in the past decade, so too has the global process for developing and disseminating technology. However, the rhetoric from many states on the issue of technology diffusion is stagnant and more appropriate to an earlier time. This rhetoric has led to an unproductive political debate that places industrialized states at odds with more radical members of the Non-Aligned Movement (NAM).

Evaluating the challenge of export controls within the context of this political dynamic, the panelist suggested that the term "export control" would be more aptly defined as "to regulate" instead of the cold war notion of "limitation and denial." Export control failures have shown that while national licensing systems can increase the cost and difficulty of acquisition, they can do little to deny the overall efforts of a concerted proliferator. The current role of export controls should be to facilitate the global dissemination of trade in a security context, thereby acting as trade enablers rather than trade restraints.

Within the political debate, radical NAM members have frequently characterized export controls as neocolonial tools used to perpetuate Western economic dominance over lesser-developed countries (LDC). This criticism has appeared during negotiations of nearly all multilateral nonproliferation treaties and regimes, such as the Nuclear Nonproliferation Treaty (NPT), the Chemical Weapons Convention (CWC), and the ongoing negotiations of the Biological Weapons Convention (BWC) Protocol.

The North-South debate centers on NAM accusations over the failure of industrialized states to meet their treaty obligations for international cooperation and development. Three specific criticisms serve as the basis for this argument. First, export controls deny materials and technologies essential for LDC development. The panelist noted that this accusation is not supported by empirical data. For chemical exports, the U.S. regulates only 10 percent of the industrial chemical trade, and only denies less than 10 percent of this regulated amount.

Second, the NAM also argues that multilateral export controls are ineffective in the face of concerted proliferation efforts. The panelist conceded that while that may

be true to some extent, it is often the provisions in multilateral arms control agreements, which mandate international cooperation, that permit legitimate controls to be circumvented. Finally, export controls are viewed as reinforcing the security interests of developed states while barring LDC from achieving the economic development they originally sought when joining the regime. The panelist opined that this argument advances a false dichotomy, and that multilateral arms control serves to advance world security and economic interests. The third NAM argument concerns the role of supplier groups such as the Australia Group (AG).

The NAM and the Australia Group

The AG, an informal suppliers group compromised of more than 30 states, serves to coordinate and harmonize national export control policies in the areas of chemical and biological materials and equipment. The NAM accuses the AG of being a self-selected and hence discriminatory club of wealthy industrialized states unconcerned with the development and security needs of other states. The NAM contends that the AG creates its own rules that are applied inconsistently, based on whether a state is perceived as a foe or a partner. During the course of final negotiations of the CWC, the NAM made concerted efforts to bargain their support for the treaty in exchange for dismantling the AG and removing all national export controls for States Parties in compliance with the Convention. While the NAM was unsuccessful, the question of export controls and how they reconcile with CWC obligations for economic and technological cooperation, continues to be a contentious issue amongst States Parties. In the current BWC Protocol negotiations the NAM's position, of withholding support for consensus in the absence of the AG's dismantlement, will prove to be a major impediment to a successful outcome.

The panelist offered three responses to NAM attacks on the AG. The first is that neither the CWC nor the BWC are currently strong enough, or have fully demonstrated their effectiveness in preventing proliferation, to justify disbanding the AG. The CWC has yet to achieve universality and the international inspectorate's ability to verify compliance is still uncertain. Similarly, there is currently no compliance regime associated with the BWC and it remains unclear whether current negotiations will be successful in establishing a capable regime. The conditions necessary for AG members to reevaluate their current harmonization practices - universal membership and verifiable compliance with international treaties capable of enforcing their mandates in a transparent and open manner - have yet to be achieved.

The second response to NAM criticisms of the AG is that, at present, no capable alternatives exist. Two NAM suggestions for alternatives to the AG are export controls within treaties that would not apply to those members in full compliance and greater focus of end-user transparency. The panelist offered that internal controls would prove difficult to negotiate and likely result in a lowest common denominator effect, which would denude their effectiveness. Such a system would also require State Parties to develop strong national export control systems to prevent retransfer to non-member third parties. To date, the states most vehement in their opposition to the AG have proven unable or unwilling to codify their own national standards. Lastly, an internal system would depend on an organizational determination of which states are in "good standing." Compliance determinations with-

in the current treaty construct are national decisions, a position unlikely to be altered.

The NAM has also proposed a shift from national export controls towards a system emphasizing declarations and end use transparency monitored through on-site activities. While this could increase confidence, a shift from export controls would result in an overall decrease in the scope and impact of controls. An end user transparency regime focuses attention on transfers that have already occurred, while national licensing policies look to proposed transfers, the stage when interdiction is most effective. Once a transfer has already occurred it is considerably more difficult to negate its impact. Further, a transparency regime monitored through on-site inspection would be difficult to implement and verify.

The last argument against NAM criticisms is that the AG serves as a mechanism to facilitate responses to noncompliance. History demonstrates that some states will continue to seek to circumvent international treaty norms. The AG provides a means of responding and a mechanism for rallying international support against chemical and biological weapons (CBW) proliferation. Absent an effective response to proliferation threats regimes will erode along with the international norms they serve to uphold.

This panelist did not foresee a scenario in which the role of the AG would diminish in importance in the near future, nor would political debate be easily resolved. The most practical course of action may be for AG members to direct their efforts not at hard-line NAM members but toward nonaligned swing states capable of influencing the political discourse. These moderate states may be better positioned to recognize the economic and security advantages offered by supplier controls. However, it may be difficult to align key states with AG objectives without an invitation of membership.

The panelist advocated a course of action consisting of several steps. Efforts to bolster the international norm against CBW proliferation must be increased. The United States and others must embody these norms in effective national control systems and respond to instances of noncompliance. Heightened end-use transparency should be explored in an effort to integrate its principles into a larger nonproliferation strategy. Lastly, both AG and NAM members must acknowledge appeals of mutual interest in a workable system with the goal of achieving greater cooperation in the nonproliferation field.

BWC: Prospects for a Verification Protocol

Another panelist focused attention on the issue of dual-use biotechnology and the challenge it presents to the ongoing BWC Protocol negotiations. The panelist described several operative articles of the BWC in order to provide a context for his discussion on export controls and current negotiations. Article I bans States Parties from possessing biological materials in types and quantities that exceed requirements for peaceful uses. The BWC does not limit proscribed items or material but rather nefarious intent. Article X states that signatories will engage in broad cooperation for the purpose of economic and technological development. This Article, along with a similar article within the CWC, has been used by NAM states to attack supplier control groups like the AG and is of key importance to export controls and current negotiations.

The panelist framed his discussion with an analysis of the nature of controls

sought in the biotechnology area. Biological sciences are information rather than material or equipment limited. Verification of limits on biotechnology is vastly different from verification in the CWC or the NPT, which seek to limit and control materials. Complicating the problem of information-control is the explosion of legitimate applications of toxic biological material, particularly for human therapeutic trials. In the United States alone there are 54 approved uses for botulinum toxin resulting in the administration of over two million doses of botulinum toxin last year alone. Many of the studies leading to approval by the Food and Drug Administration were conducted abroad, many in the Middle East.

Pursuit of a BWC Protocol has been affected by the increasing emergence of communicable diseases, many of which have the appearance of an accidental or intentional biological weapons (BW) release. The panelist referred to the 1993 outbreak in New Mexico of Hanta virus, a pulmonary illness with a fatality rate of 60 percent. The mysterious nature of the disease and its high fatality rate resulted in accusations that the United States had engaged in a BW experiment. Due to the rapid response of the public health community, the virus, its vector, and its major risk factors were identified within three weeks. The Hanta virus example, a plausible BW scenario in the panelist's estimation, is instructive in that monitoring disease outbreaks of suspicious origin can benefit public heath and can rapidly assess whether the outbreak is naturally occurring or intentionally introduced.

The panelist described work being carried out in the field of cooperative disease monitoring between U.S. and Russian laboratories on research into Hepatitis C. U.S. labs have engaged Russian laboratories, many of which were formerly associated with the Soviet Union's offensive BW program, to conduct research on emerging diseases. This work has increased transparency, understanding, and the flow of information between the laboratories.

The panelist concluded that cooperative disease monitoring is an exercise in the exchange and proliferation of information of public health importance. This information can be easily and rapidly exported to countries facing similar outbreaks, thereby fulfilling Article X obligations under the BWC. Additionally, in circumstances where a disease outbreak is of suspicious origin, cooperative monitoring will provide the experience needed to easily differentiate between naturally occurring and intentionally introduced diseases. Efforts to negotiate a strengthened BWC will be unsuccessful without provisions to promote cooperation and nonproliferation. Experience in cooperative disease monitoring with Russian laboratories can be of value in accomplishing both of these objectives.

BW Production: A Practitioner's Experience

The last panelist offered a detailed discussion on the difficulty of discriminating between the illicit and legitimate applications of biological production processes, techniques, and equipment. The initial stages of both legitimate biological applications and BW production involving biological material, agent, feed material, seed material, principal reaction, and concentration, are in the panelist's opinion not just similar but identical.

Differences between BW production and the production of legitimate biological products often occur at the later stages of the production process. The final production stages of BW differ significantly from legitimate production processes. Deviations

occur at the following stages: concentration, filling, milling, assembly, storage, drying, testing, and quality control. For example, a legitimate facility involved in vaccine work would fill and store its product in small ampoules and would emphasize quality control. BW production would likely use large glass-lined vessels, and would place less importance on quality assurance. Additionally, the milling process is a necessary technique in the production of sophisticated BW agents but has few legitimate production applications.

The export control community can use the attempted acquisition of high-capacity specialized milling and drying equipment and the presence of high biosafety levels as indicators of illicit production. These indicators may represent critical nodes that the export control community can attempt to interdict. However, these production differences represent only one indicator of many needed to identify a BW program. He cautioned that such a determination would require a large number of indicators.

In order for a state or group to portray a BW facility as a legitimate biotechnology facility the facility would have to be staffed with personnel possessing extensive knowledge of legitimate production processes. The panelist surmised that the high level of specialized information associated with areas of legitimate production would make this a difficult task. The absence of such personnel would also be an indicator of illegal BW production.

Another indicator of BW production that differs from most legitimate applications is the biosafety level (BL) applied at a laboratory. A laboratory engaged in BW research and development or production would normally operate at higher biosafety levels (BL-3 or 4), as opposed to legitimate production processes that would operate under lower biosafety levels (BL-1 or 2). Higher biosafety levels would include powerful waste treatment facilities, a large number of autoclaves and disinfecting chambers, and an advanced air supply system. These are useful indicators in identifying a laboratory's function.

The panelist cautioned that these biosafety level indicators are modeled after large-scale production processes like the ones formerly undertaken by the United States and the Soviet Union. A country seeking smaller quantities, and showing little concern for the safety of its workforce as demonstrated by Iraqi BW program, would not apply such stringent levels of safety.

Summary

Biotechnology represents a significant export control challenge. Its dual-use nature and the difficulty of controlling information as well as equipment demands greater focus and an innovative approach to BW arms control. Greater attention to critical nodes of technology in the BW production process may be the most effective focus for the export control community. Ongoing negotiations on the BWC Protocol will prove crucial to addressing this threat. A key area to be addressed in this debate, and in the larger international security dynamic, is the need to reconcile the security and economic interests of industrialized states and lesser-developed nations. Initiatives in cooperative disease monitoring may represent the path towards information sharing and technological development, while creating the experience base necessary to ensure compliance with the regime.

PLENARY 2
PROLIFERATION AND CONTROLLING ARMS: COUNTERING THE SPREAD OF WEAPONS OF MASS DESTRUCTION

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Introduction

Assessing the effectiveness of nonproliferation efforts is difficult since it is proliferation, not nonproliferation, that is the more natural metric of measurement. Nuclear nonproliferation measures seemed to be effective until India and Pakistan conducted nuclear tests in 1998. The recently published Rumsfeld report noted that the tests in South Asia should not be viewed solely as a temporary setback to the expanding reach of nonproliferation regimes, but a reflection of a disturbing trend regarding the proliferation of nuclear, chemical and biological (NBC) weapons and delivery systems.

The relationship between proliferation and controlling arms is changing because of new political, technological, and economic realities. The session examined the proliferation of weapons of mass destruction (WMD), efforts to prevent and counter proliferation, and expectations for the future of the nonproliferation regime. The participants expressed a wide range of views. Some advocated traditional nonproliferation as demonstrated by a broad spectrum of multilateral arms control treaties. Others proposed non-traditional approaches based on developing human versus technical resources and creating a professional nonproliferation expert, akin to the "Sovietologist" of a previous era. And finally, there were those who supported a counterproliferation strategy to address nonproliferation shortfalls. Given the new realities, it is truer today than ever that there is no one magic solution for preventing proliferation; it must be combated with the full range of available tools while new ones are being developed.

The New Reality: An Increased Risk of Proliferation Surprise

One panelist noted that the risk of proliferation surprise poses a formidable new challenge that nonproliferation activities must address. The past 14 months have been difficult for the nonproliferation community. Recent proliferation concerns in-

clude the nuclear tests in South Asia; continued Iraqi obfuscation and division with the United Nations Security Council; accelerated missile development in Iran, North Korea, India and Pakistan; and uncertainty over the security of WMD materials and intellectual expertise in the former Soviet Union. The intelligence community (IC) has noted an increased level of cooperation among rogue states, more concerted efforts by proliferants to conceal illicit activities, and a growing interest by terrorists in acquiring WMD capabilities.

The growth of multilateral arms control has spurred new proliferation uncertainties regarding compliance with regimes, agreements, and understandings. Undeterred or undetected proliferation threatens to undermine nonproliferation and arms control regimes and norms, thereby weakening the fabric of international security.

The U.S. IC is allocating additional resources to the problem of proliferation surprise, but the risk of undetected proliferation is growing. The IC regards ten proliferant states as primary acquisition end-user threats, but also directs focus on some fifty states whose proliferation role may be that of supplier, intermediary, enabler, or end-user. The panelist offered that U.S. analytical and collection coverage is overburdened, and that greater insight into the capabilities and intentions of states of concern is required. Redoubled efforts at denial and deception by concerted proliferants and the increased ability to acquire complete systems, such as North Korean missiles or unsecured former Soviet stockpiles, increases the difficulty in tracking the development of proliferation programs, even in states of the highest interest.

The depth and breadth of the global proliferation problem are prime contributors to creating surprise in the arms control and nonproliferation area. The challenge in addressing horizontal proliferation and the interrelationship between primary and secondary actors is another root of surprise. For example, North Korea's export of missiles is a key enabler for missile development in Iran and other states. Interrelationships among events are also important. The nuclear tests in South Asia and the missile launches in Korea are disconcerting in their own right, but when these actions and the efficacy of the subsequent response from the nonproliferation community are viewed in tandem by potential proliferants, they can influence behavior in ways not fully understood.

Another complicating factor is that of dual-use technology. Legitimate and illicit production of chemical and biological products can be indistinguishable in many cases. The dual-use dilemma complicates the problem of the merging of intentions and capabilities. In this area, proliferation is information-limited, and the intent of actors must be gauged. While dual use capabilities require that we better understand intentions, traditional tools for monitoring and intelligence collection are not designed to deal directly with this task. Tools such as national technical means, on-site inspection, export controls, surveillance, and interdiction are limited in their ability to measure 'evil intent.'

Other factors may also increase the risk of surprise. Violations of agreements or developments of proliferation concern can occur at much lower levels and still remain militarily and politically significant. For example, the acceptable detection threshold of chemical or biological weapons is far lower than what is regarded as acceptable under the Conventional Forces in Europe Treaty. In addition, subnational actors, technological

developments, and the changing face of the modern battlefield augment the danger of proliferation surprise.

In light of the size, complexities and magnifying factors of the proliferation problem, the panelist examined the steps that can be taken to mitigate the risk of undetected proliferation. A strategic focus is required to set priorities and guide action among the spectrum of arms control and nonproliferation policies and their implementation. He noted that this is difficult for government officials who tend to operate in a crisis management mode. The greater the risk of surprise the greater the importance of employing a synergistic approach that draws from the full range of nonproliferation and counterproliferation measures - from establishing and implementing norms and regimes through diplomacy and cooperative threat reduction, to counter actions, consequence management, deterrence and defense, forensics and ultimately, if necessary, retaliation.

Several specific strategies warrant consideration. First, technology itself can help. Promising areas include new sensor development, processing techniques, and information handling, which can increase analytical efficiency. However, the panelist noted that a great deal more work must be done, and technology alone cannot evaluate the dynamic between intentions and capabilities. Technology can mitigate the risk of surprise in some cases, but can be vulnerable to countermeasures and deception. Second, it is important to recognize that we are indeed in a new era. In some instances, old approaches are acceptable. In others, new approaches are required. It would be useful to look to existing initiatives like the Cooperative Threat Reduction program and determine how its successes can be applied in other areas. In addition, the panelist offered that policymakers must be cognizant of the fact that uncertainties do exist, as evidenced by the findings of the Rumsfeld Commission.

Third, there is a need to form new partnerships. As concerns biological weapons, the breadth of the proliferation problem is such that the nonproliferation community needs to develop closer relationships with entities like the biotechnology industry, law enforcement, and the public health sector. Finally, proactive leadership is necessary; the proliferation problem requires an ability to get ahead of and shape events rather than respond to a series of crises.

Limiting Proliferation in the New Reality

The second panelist, noted that in the post-war period, the United States has been amazingly successful in limiting the spread of nuclear weapons. The number of countries that have chosen to acquire nuclear weapons is a small percentage of those actually possessing the capability. The fact that nearly two dozen states in East Asia and Europe have chosen not to develop nuclear weapons proves that efforts to limit the spread of WMD can be successful.

The United States' first line of defense is to prevent countries from acquiring WMD and their delivery systems. Prevention can occur by denying technical capabilities and influencing countries to regard restraint as being in their self-interest. Even when countries develop WMD and ballistic missiles, it is important to use both technical and political means to limit the extent to which these nations expand, modernize, and export their capabilities. The ultimate objective, in the panelist's opinion, is to create the conditions that will convince countries that it is in their interests to restrain or roll-back their capabilities. However, it is far more difficult to persuade a state to forfeit

an existing capability than to foreswear its future acquisition.

There are three areas where the United States has tools to prevent countries from acquiring and developing WMD and their delivery systems. These areas are strengthening international nonproliferation treaty regimes, dealing appropriately with nations where proliferation has occurred, and engaging key supplier states that could be the source of horizontal proliferation.

The international nonproliferation regime includes a myriad of treaties, organizations and multilateral suppliers groups. It serves as a framework to prevent or limit proliferation, and includes several important mechanisms. They enable countries to express their political commitment to foreswear or limit WMD capabilities, help to verify state party compliance, facilitate the international harmonization of export controls, and mobilize pressure on those countries outside the regime or that violate their international obligations.

The panelist believes that the current U.S. Administration is highly focused on a number of issues concerning the international nonproliferation regime. One priority is the Comprehensive Test Ban Treaty (CTBT). There is a reasonable prospect, in the panelist's opinion, of convincing India and Pakistan not to conduct additional nuclear tests. The U.S. decision on whether or not to ratify the CTBT will significantly impact how other countries decide the same issue. Believing that the CTBT serves U.S. nonproliferation interests, the Administration has placed high priority on gaining Senate advice and consent of the treaty.

Another priority is the Biological Weapons Convention (BWC), the effectiveness of which is compromised by a lack of a verification mechanism. The U.S. government is engaged in multilateral negotiations to develop mechanisms to strengthen the BWC. Negotiations are complicated because of the need to balance, particularly in Western countries, the protection of proprietary and national security information with the establishment of an effective inspection regime that will deter and detect cheating.

A third important area is the Nuclear Nonproliferation Treaty's (NPT), Five Year Review Conference in 2000. This is the best-developed, most universal, and effective nonproliferation regime, in the panelist's opinion. Despite its stability, a number of difficult issues will arise at the review conference. These issues include addressing calls for a timetable for complete nuclear disarmament and how member states should deal with the four nations (Cuba, India, Israel, and Pakistan) that remain outside the regime.

Finally, it is important that the United States start negotiations on a Fissile Material Production Cutoff Treaty (FMCT). The FMCT would be an effective means of limiting the further accumulation of unsafeguarded fissile material. A key challenge in these negotiations will be achieving consensus over the disposition of existing stockpiles held by nuclear weapons states.

The panelist examined the question of how the United States should address regions of proliferation concern, such as the Korean Peninsula, South Asia, and the Middle East. In each of these areas countries have decided that it is in their interest, even vital to their perceived status and security, to pursue and develop WMD and missile capabilities. Regional solutions that adequately address the fundamental incentives and motives that drove states to acquire WMD capabilities are not readily apparent. The panelist addressed areas where the United States

can take steps to limit proliferation in these regions.

In North Korea, the 1994 "agreed framework" was established to limit further plutonium production. The panelist asserted that the framework was highly successful in fulfilling its purpose and there is a good chance that it will remain in place; thereby limiting North Korea's nuclear weapons capability. A much greater challenge will be limiting North Korea's missile activities. North Korea has claimed that exports of long-range missiles are an important source of hard currency. The Administration is examining whether the United States can achieve a political solution that would further limit North Korea's missile testing and sales.

In South Asia, India and Pakistan sought to acquire nuclear weapons for over twenty years and missile systems for over a decade. While there is little prospect of stopping or rolling back these pursuits, there are reasonable expectations for controlling quantitative and qualitative advances in their respective nuclear programs. The U.S. Administration is focusing political capital on encouraging a halt to further nuclear testing in South Asia, in order to control advances in nuclear warhead designs.

Finally, in the Middle East as in South Asia, there are no imminent political solutions. It will not be possible in the near term to dissuade a country motivated by national security to build and retain WMD capabilities. The panelist noted, however, that there is some prospect for limiting Iraq's capabilities through the continued application of U.S. sanctions until Baghdad complies with UN Security Council resolutions. Iran still needs considerable assistance to advance beyond short-range SCUD-like systems, and efforts must be directed towards limiting access to foreign technology critical to ballistic missile development.

A final issue of importance for advancing the U.S. nonproliferation agenda is dealing effectively with supplier countries including Russia and China. Russia is currently the most significant proliferation threat. Poor government controls and the economic hardships faced by former WMD scientists could result in a critical leakage of material and expertise out of Russia. This leakage could accelerate a country's acquisition of new or enhanced WMD capability. While the United States has worked very closely with Russia on these problems, one area of perennial concern is the transfer of missile and nuclear technology from Russia to Iran. Given the current political conditions in Russia, the panelist felt that it would not be possible to completely prevent the flow of technology, but rather limit its potential damage.

The situation with respect to China has improved considerably over the last decade, in the panelist's estimation. China has made new commitments and enacted more effective export control mechanisms, especially in the nuclear area, where it has cut off assistance to Iran's nuclear weapons development program. Despite progress in the nuclear area, China's control over missile technologies remains problematic. China has indicated a willingness to meet the standards required to join the Missile Technology Control Regime (MTCR), but the first challenge will be to overcome difficulties in current U.S.-China relations. The panelist was optimistic that, ultimately, China would align itself with the MTCR's provisions.

Human Resources: A Nonproliferation Tool for the New Reality

The proliferation threat is a complex, multifaceted and multilateral problem laden

with diversity of capabilities, interests and perspectives. Responding to proliferation, in another panelist's opinion, requires an understanding of what causes states to develop WMD capabilities. It is important to comprehend the internal and external factors that motivate a state, such as the domestic factors and considerations critical to how a state perceives itself and its available indigenous resources. If the nonproliferation community is to achieve its objectives, it must comprehend the differences between states that rollback WMD programs, such as South Africa, Argentina, Brazil, Belarus, Kazakhstan, and Ukraine, and other states that continue in their WMD acquisition efforts, like North Korea and Iraq. Viewing the threat from this perspective shows that there has been an insufficient focus on the human aspect of proliferation. The United States has arguably looked too often for technology-based answers and responses that provide quick relief, but do not change the overall dynamic.

One panelist argued that to change the dynamic a stronger multinational, normative foundation in support of nonproliferation must be created. This multilateral norm should be accompanied by better human resources to devise innovative ways to cope with proliferation threats and developments. Human capabilities are at the core of understanding and effectively responding to the proliferation threat. Nonetheless, what is required to nurture and sustain these critical resources is consistently underestimated.

Human resource needs - relevant to nonproliferation - can be examined at two levels: the need for high-level quality leadership with nonproliferation expertise and experience; and the need for broadly defined education, training, and community building. An effective nonproliferation strategy depends on a trained cadre of leaders and experts who will collect relevant information in usable forms, and construct and effectively implement appropriate policies over time, both in the United States and abroad.

According to the panelist, the United States is investing much more in technologies than human capabilities. There is an imbalance today between the human skills capable of analyzing information and the ability to technically collect that information. While technical fixes to address the lack of human capabilities, such as better means of information collection and integration, can be helpful, without proper training to develop an analytical mindset that recognizes the need for multidisciplinary approaches, information will not be effectively or coherently exploited.

There is value in using education and training to create communities that understand the proliferation threat in other countries, especially China, Russia, or Iran. Creating and sustaining nonproliferation activities requires a security and safeguards culture that many states do not possess and international organizations have not nurtured. In the panelist's opinion, training regarding the proliferation threat is required in order to foster and maintain the cultural mindset underlying a state's nonproliferation posture.

The panelist outlined several specific steps that could be taken to better address the human resources gap existing in current nonproliferation approaches. First, the United States needs to institutionalize high-level and continuing leadership and attention to nonproliferation issues. A senior nonproliferation coordinator needs to be established with a mandate to revitalize the nonproliferation policy agenda. Second, education should be regarded as a viable and critical nonproliferation tool. The U.S. national security community has tended to conceptual-

ize proliferation decisions primarily in terms of technological and security-driven causes with corresponding technical and international security driven solutions. There is a need to focus more on the domestic political context in which proliferation decisions are made, by devising education strategies that reinforce restraint through the development of nonproliferation cultures, norms, and constituencies. Community building efforts would form the basis of a successful long-term nonproliferation strategy.

Finally, a new mindset focusing on human resources has to be promoted. The United States needs to train nonproliferation specialists. The United States should address the nonproliferation threat with the same strategy employed against the Soviet threat, namely investing in the development of personnel with advanced multi-disciplinary expertise. This could be promoted through a National Nonproliferation Education Act, similar to the National Security Education Act that helped fund scholarships for students interested in Soviet studies. The field of study would be broadly defined to include such areas as NBC terrorism, country or regional studies, and the spread of WMD and their delivery systems.

Critical Analysis and the New Reality

The final panelist to comment emphasized that it is important for members of the arms control and nonproliferation community to remain critical and focus on existing proliferation threats to security. In the area of NBC proliferation, the smallest failing can be disastrous. As such, the United States needs to identify the location and size of those security gaps.

A credible argument can be made that most states do not want WMD for themselves or their neighbors. This is reflected by the 185 signatories and only four non-signatories to the NPT. An equally positive indicator is the 145 BWC members and the growing number of states that have ratified the Chemical Weapons Convention (CWC). Clearly, the majority of states regard the international norm of restraint to be in their self-interest.

Several factors keep nations in regimes, deter cheating, and impact the decisions of those outside regimes. The most important is a nation's confidence in its security. Nations that are confident in their own security do not go out and incur the expense and inconveniences associated with WMD acquisition. A corollary to this statement is that confidence can also arise from assurances provided by other states and alliances. The U.S. nuclear umbrella provides security assurances to a number of key allies, and the continued credibility of that deterrent is essential. The United States must be perceived as able and willing to guarantee its assurances, which requires both the technical capability and political will to support the assurances that we provide to others.

Beyond confidence in national security, maintaining a nonproliferation regime requires the full and aggressive implementation of all its verification tools. The various nonproliferation and arms control treaties have associated verification measures. While these measures are employed adequately in some regimes, the panelist regarded the absence of a request for a challenge inspection to be a glaring shortfall in the implementation of the CWC. Advocates of the CWC argued that this verification measure would deter and detect noncompliance, but it has yet to be employed. Another panelist pointed out that the challenge inspection regime faced two issues of concern, which are the likely causes of it not being used. The Organization for the Prohibition

of Chemical Weapons (OPCW), tasked with implementing the regime, is still in a building mode and is not yet at a point where it is capable of executing this type of inspection. Additionally, there is a desire that the first challenge inspection should not be frivolous, that it, in effect, be a "smoking gun" inspection.

Also affecting a state's compliance with a regime is a clear system of punishment for noncompliance. The international community should be able to punish and not reward those in violation of agreed norms. There are too many examples of states that have safely and systematically violated norms critical to the viability of nonproliferation regimes. Failures to punish past violations include Iraq's and Iran's use of chemical weapons, North Korea's violations of its NPT obligations, and Russia's biological weapons program, despite the fact that it is both a BWC signatory and depository. The last thing that should be done, in this panelist's view, is to reward violations. However, it is easy to characterize the U.S. response to North Korea's nuclear program as a reward. The United States has in effect provided North Korea more time to turn the plutonium it has already separated into nuclear weapons.

In addition, the panelist argued, the United States needs to ensure all nations know that aggression, especially the use of WMD, will be met with a swift and devastating response. The United States should be prepared to preempt a WMD capability if there is any indication that these weapons would be used aggressively. A serious counterproliferation program is necessary, enabling the United States to destroy NBC capabilities. According to the panelist, if the United States can't stop proliferation by other means it should be prepared to do so militarily. Another panelist disagreed with the preemption position, arguing that intent and possession are different and that preemption requires a solid understanding of intent.

There are continuing threats to the nonproliferation regime and important measures are needed to maintain its credibility. In the nuclear arena, an unfortunate idea that has gained some acceptance is the notion that the NPT is a favor to the United States, which must provide concessions to keep other nations within that regime. One of the concessions advocated by the Non-Aligned Movement (NAM) is a time-bound framework by which nuclear states will give up their nuclear weapons, as the price for a successful outcome to the NPT Review Conference in 2000. The United States and members of the P-5 should affirm their commitment to nuclear threat reduction, but make clear that time-bound disarmament is not an option. Since many nuclear-capable states have refrained from nuclear weapons development based on the U.S. extended deterrent, any commitment by the United States to accept this NPT concession would likely cause multiple cases of nuclear proliferation in North Asia and Western Europe.

Another threat to the nonproliferation regime, in the panelist's view, is the CTBT. The CTBT is a disarmament treaty rather than an arms control treaty. It challenges U.S. assurances and the credibility of the U.S. nuclear deterrent. A weakened U.S. deterrent is more of a threat to the nonproliferation regime than continued nuclear testing. The panelist contended that existing nuclear capabilities in South Asia are sufficient to deter regional nuclear conflict, and that limited resources make a costly arms race unlikely, with or without their ratification of the CTBT.

According to the panelist, the biggest threat to the nonproliferation regime is the

international community's continuing inattention to the legacy of the Soviet Union's biological weapons (BW) program, and Russia's ongoing BW development activities. Russia is not merely a signatory, or a simple violator, but a depository of the BWC, and thus has a special responsibility with respect to the integrity of the treaty. Russia ought to be leading the way to make sure that the whole world is aware of the potential threats it created while in violation of the BWC over the past 20 years, so that nations can be better prepared to deal with these threats. One panelist interjected that while increasing transparency in Russia's BW program is a U.S. objective, it has been overshadowed by other political, economic, and security concerns on the U.S.-Russian bilateral agenda. The establishment of a verification protocol within the BWC would vest the international community with the tools necessary to gain insight into this BW program.

The international nonproliferation regime could be strengthened, the panelist argued, by establishing a treaty limiting the spread of ballistic missiles. One proposal involves the internationalization of the Intermediate Range Nuclear Forces (INF) Treaty to replace the MTCR, which is regarded by the NAM as a discriminatory regime imposed by suppliers group. Internationalizing the INF Treaty is a key step in controlling delivery systems, as the current MTCR approach neither establishes norms for action nor reconciles possessor and nonpossessor states.

Summary

Recent events have demonstrated that surprise remains a key variable in the nonproliferation calculus. The panelists articulated several different means of dealing with surprise while curbing proliferation. These run the gamut from increased reliance on technology, cooperative efforts, and traditional arms control regimes to relying more upon human resources and the systematic training of nonproliferation professionals. While there was ample discussion about the relative merits of the "tried and true" versus the "innovative and daring" nonproliferation approaches, there was a general note of concern that states should not overlook the tools that existing arms control treaties provide, nor neglect to punish those states that have transgressed. In order to be effective, nonproliferation must take place across the entire spectrum of responses. Active engagement in negotiating nonproliferation and arms control agreements must be followed through with full and proactive implementation of those agreements, and finally a systematic and multilateral approach to enforcing existing agreements and deterring and punishing noncompliance when it occurs.

PANEL 5
WHAT IS THE ROLE OF ON- SITE INSPECTION IN FUTURE ARMS CONTROL AGREEMENTS?

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Introduction

On-site inspection (OSI), in its modern form, is essentially a creation of the 1990s and a product of the Intermediate-Range and Shorter-Range Nuclear Forces treaty signed in 1987 and implemented in 1988. While used extensively as a bilateral verification tool, OSI has become a central part of multilateral arms control. With regards to arms control verification, the question of whether we need people or technology is not an issue - we need both. The real question is finding the balance between these necessary components. Today, the human aspect of verification, as represented in OSI, is as important in making verification judgements as are the other aspects of arms control. Compliance questions are no longer viewed singularly through the lens of national technical means (NTM). The complexities of the human dimension – its unpredictability and its capability to adapt to change – serves as both an advantage and benefit to OSI. The panel examined the role of OSI, employed at both the bilateral or multilateral level, and its contribution to the security environment.

Mutual Verification Works Best

The first panelist noted that the intrinsic value of OSI is obvious and results from the presence of inspectors in the field. Inspectors have the ability to monitor and detect inconsistencies and irregularities that cannot be predefined. That is especially true when looking for undeclared activities. Moreover, inspectors can adapt inspection activities in real time to exploit mistakes, negligence, or accidents and provide timely warning by reporting any attempted concealment.

However, these significant advantages are limited by several factors such as the training and motivation of inspectors, the corporate culture of the inspectorate, the availability of resources, and constraining treaty provisions. Even under ideal condi-

tions OSI has inherent limitations, such as the inspection team's dependence on the cooperation of the inspected state, and its political commitment to comply with international legal obligations. The most important lesson from the United Nations Special Commission's (UNSCOM) experience in Iraq is that inspection objectives cannot be achieved if an authoritarian government is running a sophisticated concealment campaign.

Verification effectiveness depends heavily on the political context. Arms control and disarmament treaties, and their verification regimes, deal with symptoms of deeper problems. The core problems are always connected directly to a political conflict, or at least to a political choice and the political commitments reflected therein. Internal dissension within the United Nations Security Council, and dedicated Iraqi opposition to OSI has nullified the effectiveness of the UNSCOM mission.

Compliance depends on the nature of the political regime. Any regime considering clandestine noncompliance will have to take two factors into consideration: the probability of disclosure and the risk of getting caught. Government attempts at deception are often prevented by internal measures found in open democratic regimes. Effective internal checks and balances, like a free press and individual freedoms, are usually found in such regimes. The risk of illicit activity being detected is higher within these regimes, and the internal political implications of being viewed as a "rogue state" are obviously more significant when a government is accountable to its populous.

If the value of OSI depends so heavily on the political commitment of an inspected state, then ironically OSI is much more effective when it is needed less. The panelist questioned whether it is worthwhile to invest the political effort in negotiating OSI measures and the resources needed to apply them in the field. However, the panelists did agree that OSI is of value provided its inherent limitations are recognized. An inspection effort, even if it falls short of ensuring compliance, will compel a proliferator to operate under difficult and somewhat uncertain conditions - for example, being denied the use of declared and inspected sites. This may delay a weapons program and increase its development cost. Additionally, if concealment efforts are detected and reported to the international community, the evidence gained from OSI will serve to mobilize an international response against the proliferant state. Ignoring the necessary political context in any verification regime may create dangerous illusions. Absent the Gulf War, Iraq's breach of its international obligations would have gone undetected.

Verification regimes must focus on problematic areas if they are to achieve effective monitoring capable of searching for undeclared facilities while operating within realistic budget constraints. International organizations, however, are obliged to operate even-handedly, without singling out any state. Today the inspection efforts in Iran, conducted under the auspices of the International Atomic Energy Agency, are smaller than those performed in Canada or Brazil, for example. The dilemma therefore is between a fair, but expensive and burdensome regime, and a concentrated but necessarily discriminatory one. Verification regimes, such as those established by the Chemical Weapons Convention (CWC) and the Comprehensive Test Ban Treaty (CTBT), achieve this balance through the use of two types of inspections, routine and challenge.

The panelist noted several problems relevant to special inspections under the CTBT. Routine inspections and resource

allocation are based only on the size of the national nuclear program. However, some of the biggest national nuclear programs are in non-problematic states. The allocation of resources to these inspections remains contested. As concerns the authority to request that a special inspection be conducted, under the CTBT the organization itself reserves that prerogative, while under the CWC any state party may request a challenge inspection. While the current trend is to shift responsibility to member states, the panelist questioned whether the introduction of political decisions into the challenge inspection process would be beneficial. Special inspections are necessarily more intrusive and may entail higher probability of abuse, resulting in political harassment or breach of confidentiality.

Recent treaties include "political filters" against possible abusive inspection requests: a weak filter in the CWC and a stronger one in the CTBT. In addition, modern verification regimes include provisions for "managed access" which allow the inspected state to limit some access, provided it demonstrates its compliance by alternative measures. But these provisions by themselves may not be sufficient to satisfactorily resolve the dilemma between inspection abuse and determining compliance.

The panelist proposed that a surgical approach to verification could be highly effective and at the same time prevent abuse. Under this approach, an inspection would be intrusive and collect information relevant only and unequivocally to proscribed activities, while not breaching confidentiality. The objective of such an approach is to prevent the collection of any incidental information not specific to the proscribed activities.

There is some development in this direction, both in the CWC and CTBT, concerning the use of “blinded” software that excludes information not relevant to the treaty. This approach reduces the potential for loss of confidential or national security information, but may limit OSI effectiveness. However, for OSI to be effective this basic dilemma must be resolved and the solution applied to both inspection equipment and procedures.

In the panelist’s view, OSI conducted under a bilateral verification regime is of higher value than multilateral regimes. When inspectors from one state go to another, they shoulder a national responsibility and feel personally motivated to look for uncertainties. Furthermore, under bilateral verification, the inspectors go to the field with the full backing of their country’s technological capabilities. Access to intelligence data derived from NTM and other sources are invaluable tools for an inspection team.

Under a bilateral verification regime, other problems can be resolved satisfactorily. Inspector selection and tenure is free from international, political considerations such as equitable geographical distribution. Inspector training can be more thorough and include confidential information as necessary. Generally, a healthy culture of "no trust" develops naturally under a bilateral verification regime.

The panelist indicated that in multilateral organizations, however, competing objectives often denude the efficacy of the verification regime. In such organizations the need to resolutely deal with a specific problem, that may incidentally expose the inherent limitations of a regime, conflicts with the need to maintain an image of credibility and integrity.

Bilateral verification regimes have demonstrated additional advantages. Each state can concentrate its verification efforts,

as it deems necessary, without having to consider the regime's universality. The mutual character helps prevent abuse because of the potential for retaliatory obfuscation. It should not be surprising therefore that bilateral verification has the highest value, in the panelist's estimation. Since verification efficiency depends so heavily on political conditions extraneous to the verification regime itself, one cannot expect to find a uniform solution that will be universally effective. Bilateral and regional approaches based on mutual verification can deal more effectively with specific areas of concern than multilateral regimes, especially in conflict situations.

An International Perspective: Searching for Efficiencies

It is useful to consider the recent CTBT experience when considering an international agency's perspective on OSI. According to the panelist, implementation of the CTBT is proceeding very well. The CTBT organization is being built and implementation of the various regimes and the international monitoring system (IMS) is proceeding apace.

The CTBT's verification regime was elaborated with the following objectives in mind: provide confidence that member states adhere to treaty provisions, deter member states from undertaking clandestine activities, and counteract unfounded suspicion about naturally occurring events. The principles of these objectives model those of other arms control treaty verification regimes.

The OSI provisions of the CTBT, which were very difficult to develop, comprise about one half of the treaty. They are intended to serve as a last resort to resolve ambiguities associated with information provided by the IMS. The verification provisions are elaborate and permit the international inspection team to search large areas for evidence to clarify the nature of a suspected event. They also permit the use of a number of modern technologies for on-site monitoring, which are tailored specifically to detect only treaty-relevant events. The OSI provisions also allow for intrusive techniques, such as drilling.

The CTBT Preparatory Commission addressed many details that were not resolved during treaty negotiations. The work on OSI arrangements has been undertaken while establishing the IMS. The operational OSI manual has been an extensive undertaking. Unfortunately, the panelist noted that many procedures and arrangements that exist in other treaties were reinvented for the CTBT. This is unfortunate because lessons learned from previous arms control regimes could not be fully drawn upon.

The panelist noted that a key question regarding OSI provisions of the CTBT is how confidence can be gained from a completed inspection in the absence of a "smoking gun." A naturally occurring earthquake would be the most realistic scenario for triggering an OSI within the framework of the CTBT. Generating confidence from such an inspection intended to verify a non-treaty limited event is a significant concern. An inconclusive inspection could affect the regime's credibility, and create the perception amongst potential violators that a low-yield nuclear test would go undetected, or would be labeled a naturally occurring event. This may not be difficult in the context of other regimes where events may be observed with one's own eyes, but achieving confidence is particularly difficult when inspections involve investigation of naturally occurring events with no on-site evidence.

While OSI is important for arms control verification, it should be considered

in the broader security context. It can be an integral part of enhancing confidence in arms control, military, and non-military fields. Within the military perspective OSI can reduce the risk of surprise and foster the development of military-to-military contacts and diminish a perception of mistrust. In a broader non-military security perspective, on-site activities can be useful for enhancing democracy throughout the world. An on-site presence can also be important for election monitoring and benefit human rights objectives. In general, when discussing OSI for arms control it is useful to keep in mind the broader perspective of its role in peace and security.

With this broader perspective in mind, it is useful to consider how OSI could be arranged in a more efficient way and whether synergies exist between various on-site regimes. While there is no doubt that OSI arrangements have to be tailored to a treaty or agreement, the general training and operating procedures of an international inspectorate are often similar. One must consider lessons that can be learned from other regimes, and relationships that may exist or be forged that would have implications for better use of OSI.

The panelist questioned whether an international inspectorate could be modeled after the Defense Threat Reduction Agency, which has brought together all inspection activities. For example, future treaty text could benefit from generally agreed "building blocks" and OSI operating manuals could share common elements. Inspector training could be coordinated and inspectors might be given the opportunity to support several treaties. By identifying the similarities among inspector training programs, inspector selection criteria, and other factors there is the potential to create "dual use" inspectors.

In light of potential synergies, perhaps an international threat reduction agency could be established to support the implementing organizations of several treaties. This could be a service organization for various treaties. An international threat reduction agency might carry out a number of supportive functions. These could include supporting international peace and security through an on-site presence; supporting treaty implementation by facilitating and perhaps conducting on-site inspections; maintaining and developing procedures, knowledge and equipment for on-site inspections; and training inspectors.

A National Perspective: Successes, Failures and Synergies

Another panelist noted that OSI works best when it is routine and compliance is assumed. This has been one of the important principles underlying the U.S. verification and monitoring approach to OSI. It also highlights some of the strengths and weaknesses of OSI as a verification tool.

In the U.S.–Russia context, there have been some notable successes. Specifically, OSI has served as a direct and comprehensive means to monitor the elimination and conversion of military weapons systems under the Conventional Forces in Europe (CFE) Treaty, Strategic Arms Reduction Treaty and the Intermediate Range Nuclear Forces (INF) Treaty. Under the INF Treaty, OSI has given the United States a direct means of monitoring the ban on SS-20 production at Votkinsk, a Russian missile factory. In conjunction with the detailed data exchanges negotiated under all these treaties, the United States has become increasingly confident, due to OSI activity, that Russia's declarations conform with its deployed conventional and nuclear forces.

The United States has also been able to use OSI synergistically with NTM to gain a more comprehensive picture of Russia's and former Warsaw Pact states' compliance with arms control agreements to which they are a party. Under treaties such as the CFE and the CWC, states declare the disposition and location of its respective forces, facilities, and stockpiles. OSI can confirm or dispute submitted declarations, and NTM can be directed towards non-declared areas of concern.

OSI has not been a panacea for many difficult verification problems. There are inherent limits in its ability to provide both comprehensive and intrusive means of monitoring arms control obligations. These limitations are inherent in the modalities of the inspection regimes themselves, such as the time lines for notification and transport of teams to the inspection sites. Resource constraints serve as limitations in that inspections can be conducted at only one or two sites at any time; therefore useful insights on compliance may be gained at a piecemeal level rather than a force-wide perspective. OSI is limited in terms of the degree of intrusiveness that any party is willing to bear. This is equally true whether inspector access is permitted in areas of a military facility or, for example, the extent to which a side can accurately observe the actual warhead-carrying capabilities of a ballistic missile.

Only the United States and Russia have the capability to develop and deploy large constellations of highly sophisticated technical collection systems and, consequently, only these two countries can fully benefit from the synergies between OSI and NTM. France, India and China are developing those capabilities, but on a much smaller scale. Other countries, notably the United Kingdom and Canada, have special defense relationships with the United States, as well as capabilities of their own. But the ability of NTM to supplement and compensate for the inherent limitations of OSI is restricted largely to Moscow and Washington. The panelist stated that even the advent of high-resolution commercial imagery is likely to have little impact on the problem because of the significant costs of downstream analysis and processing of satellite data. While this technical perspective may imply that OSI is not beneficial to other nations, there are indeed potential confidence building benefits. For example, in the U.S.-Russian context, OSI, de-linked from its synergy with NTM, has been dramatically successful in promoting trust, enhancing military-to-military contacts, and dispelling cold war stereotypes.

The panelist noted that caution is warranted concerning the political value and confidence-building dimensions of OSI. First, confidence building should not be confused with effective verification. Ultimately, confidence is based upon firm evidence of the inspected partner's compliance with an agreement. For OSI to be effective, it should first serve the purpose of compliance monitoring, with confidence then developing based on the outcome of the inspections. Second, the relatively positive U.S.-Russian experience with OSI may not be readily transferable to the multilateral arena. OSI is frequently limited to data declarations submitted by a participating state. Third, the international community is understandably committed to enhancing confidence-building measures by means of OSI, but at the same time many countries are resistant to the degree of intrusiveness needed to enhance the monitoring effectiveness of inspection-based regimes. The net result is that there is a risk of creating expensive, cumbersome international verification bureaucracies that are limited in their inherent

effectiveness and may become tempting targets for U.S. congressional critics of multilateral arms control.

Finally, the arms control issues that the international community is facing are extremely difficult from a monitoring and verification perspective. The panelist questioned whether some of these problems are too onerous. It is a fair criticism that issues like the Biological Weapons Convention Protocol, the CWC, and the Fissile Material Cut-Off Treaty are all plagued with the inherent problem of dual use technologies. They would require a degree of inspection intrusiveness that would not only be extremely difficult to accomplish but would likely only yield limited improvements in monitoring confidence.

The panelist asserted that despite the limitations of high-confidence monitoring, OSI has a valuable role in international security. International agreements can provide highly detailed data exchanges that, over time, lead to compliance judgements. Analysis of data exchanges is a useful way of evaluating inconsistencies in declarations, inspections, and potential compliance issues.

OSI has an important role to play in the future U.S. arms control policy, and its political benefits will continue to be an important factor in both bilateral and multilateral arms control. Where OSI cannot achieve effective verification, it must be candidly conceded and other means and technologies for improving verification must be sought. From a U.S. policy perspective, the verification risks of monitoring shortfalls are an acceptable price to pay for future arms control agreements. While this kind of candor could create formidable problems in a domestic U.S. political context, the panelist believes that a debate on the matter must take place if U.S. public and congressional support is to be sustained for increasingly complex and difficult arms control accords in both the multilateral and bilateral arena.

Summary

While a relatively new construct of arms control, OSI activity was conceived out of the necessity to "trust but verify" and with the realization that national technical means are not the only tools available to bridge the confidence gap. While OSI has been built upon the success of U.S.-Soviet/Russian bilateral arms control experience, its effective application in a multilateral forum has been questioned. The panelists noted that OSI works best where it is needed least and the successful application of OSI is dependent on the cooperation and political regimes of the participating states. Despite these qualifications, OSI is considered effective in confirming the treaty-limited items declared by a member state, while allowing national sensors to focus on areas where treaty-limited items have not been declared.

From a global perspective OSI has utility that goes beyond arms control and military uses. OSI has a role to play in humanitarian efforts and nation building, thereby contributing to the concept of national security at large. Additionally, the proliferation of multilateral arms control regimes have stimulated discussions regarding synergies between treaties and efficiencies of scale with respect to shared inspection resources. While an intriguing philosophical discussion, the complexities of the specific treaty regimes and the natural desire of member states to ensure the confidentiality of treaty related information all argue against shared inspection resources.

PANEL 6
COOPERATIVE THREAT REDUCTION — IS IT THE FUTURE OF ARMS CONTROL?

Chair
Ms. Laura S. H. Holgate
Director, Office of Fissile Material Disposition
Department of Energy

Ambassador Anton Buteiko
Ukrainian Ambassador to the United States

Ms. Monica Chavez
Assistant Vice President for Business Development & Director of Weapons of Mass Destruction Response Programs,
Pacific-Sierra Research

Mr. Friedrich Löhr
Head of Arms Control Cooperation Department, German Foreign Ministry

Introduction:

The Cooperative Threat Reduction (CTR) program was established in 1991 as a result of the legislative efforts of Senators Nunn and Lugar, to address the national security challenges brought about by the collapse of the Soviet Union. These challenges included helping the new nations of the Former Soviet Union (FSU) fulfill arms control agreements and obligations; assisting Belarus, Kazakhstan and Ukraine to become non-nuclear states; and employing idle or unpaid scientists formerly involved in weapons of mass destruction programs. The CTR program became a centerpiece of U.S. foreign policy toward the FSU by offering the former Soviet states technical and financial assistance as well as political focus – a focus that was quickly reciprocated. While the Department of Defense (DoD) had the necessary expertise for executing the weapons dismantlement portion of the CTR program, it became clear that other agencies within the U.S. government would be instrumental in expanding the CTR opportunities. Due to the creativity of many U.S. government officials, the original scope of the CTR program grew to include participation by other agencies such as the Departments of State, Energy and Agriculture. Many areas for expanded cooperation still remain both inside and outside the FSU, such as dismantling conventional weapons and landmines, limiting weapons production capabilities, continuing arms reduction beyond Strategic Arms Reduction Treaty (START) levels, reducing the asymmetric biological and chemical threat in the Middle East, and resolving the India/Pakistan nuclear weapons race. As discussed in this panel, further CTR expansion may also include social programs to support the local populations after the dismantlement efforts are complete.

Realities of the CTR Program and Its Implementation

The CTR program has experienced both ups and downs, but has recently enjoyed significant accomplishments and success. In one panelist's opinion, the biggest obstacle to implementing the CTR program was achieving mutual understanding between U.S. representatives and the participating countries. Reaching agreements that were acceptable to all participants was very difficult due to conflicting views and agendas. In addition, differences in defining and understanding key terms such as "elimination" or "dismantlement" resulted in great delays. Because the CTR program is implementing existing treaties with established deadlines and specific procedures, the participants have little room for compromise and are under significant pressure to find solutions to problems. However, due to a lack of in-depth knowledge and experience, achieving those solutions has usually required more time than is available.

One key to successfully implementing the CTR program is understanding the objectives and mentality of the other country. For example, the panelist noted that a given country may be willing to sacrifice internal stability and social welfare for increased national security. In other words, a country may favor military build up over solving economic or ecological problems. In such cases, the United States needs to proceed with caution and attempt to sway the priorities of that particular country.

In general, the CTR program has accomplished the minimal dismantlement goals established by Senators Nunn and Lugar's legislation. However, the reciprocal contributions, if any, from participating countries have been significantly less than expected. This has caused the United States to incur increased costs and significant delays in achieving CTR's objectives. It has been difficult to achieve the necessary agreements with each participating country when they have contributed little to no funding.

CTR in the Ukraine

In 1990 the Rada, Ukraine's Parliament, agreed that the Ukraine would become a non-nuclear state by adhering to the principle that it would not produce, acquire, or accept any nuclear weapons on its territory. The key to Ukraine's success in achieving nuclear disarmament has been U.S. assistance through the CTR program and the program's proper implementation. U.S. assistance has significantly influenced the Ukrainian government's decision making with respect to the economic and social problems that have directly threatened Ukraine's stability since 1990.

The panelist noted that one of the reasons for CTR's successful implementation was the fact that the Government of the Ukraine selected the appropriate agency, the Ministry of Defense, as the lead agency to administer the program, while involving several other key agencies. Another important tool was the use of a U.S. integrating contractor and Ukrainian sub-contractors during the actual elimination phase. U.S. contractors were instrumental in removing obstacles and consulting with both Ukrainian and U.S. government agencies. Employing local Ukrainian subcontractors and keeping many workers employed alleviated potential social tensions. Additional work is also benefiting the highly qualified scientists that may otherwise be enticed to accept employment from rogue states. Furthermore, Ukraine as a whole is benefiting from the ecological improvements and the reduced

risk of accidents resulting from the clean up of various sites.

The relationship between Ukraine and the United States has evolved from a purely military to a business-like relationship that continues to develop and grow through the CTR program. Recently members of the Ukrainian Rada were given the opportunity to travel to the United States to witness the elimination of a B-52 bomber. This event helped to build trust between the two countries by demonstrating that the United States is also fulfilling its demilitarization obligations. The event further demonstrated that the goal of world stability, and not merely U.S. national security objectives, is being achieved.

Ukraine has suggested that the United States can assist in other areas such as the elimination of anti-aircraft weapons, landmines, and other conventional weapons; implementation of the Chemical Weapons Convention (CWC); and supporting social programs to assist military officers displaced by demilitarization. One panelist agreed that the United States should consider these programs as a reward for the accomplishments that have been achieved through their successful cooperative efforts. This may serve as an incentive for other countries to increase their cooperation.

Ukraine hopes that its declaration as a non-nuclear state, along with its current steps toward demilitarization and disarmament, are setting an example that will further efforts toward world peace and stability. Ukraine continues to demonstrate its political will toward the new-world order by being the only former Soviet country to continuously monitor the process of its nuclear weapons destruction.

Expanding CTR and the International Community

Signing the Paris Charter established a unified Europe that set the ground rules for a new-world order. The Paris Charter and the end of the cold war present the international community with new challenges resulting from a changing global landscape. A landscape in which formerly non-aligned countries are developing new alliances and former Eastern Bloc countries are taking matters into their own hands and are severing old ties.

One panelist stated that the CTR program is not well known throughout Europe. However, Germany has contributed to the relocating, retraining, and housing of Russian military officers formerly occupying Germany; eliminating Russia's chemical weapons (CW); and eliminating silos in the Ukraine. This panelist speculated that Europeans are still skeptical of the CTR program. They feel that the program was implemented too soon after the end of the cold war and underlying differences may still exist, which may cause more problems in the future. In addition, many European countries do not have available funds to participate in CTR programs despite their strong desire and past ability to do so. It may also be difficult to involve international organizations in the CTR program, since U.S. national security objectives for the CTR program may not correspond to those of the international community.

The continuous needs of CTR recipient countries, especially Russia, cause a significant and consistent drain on foreign economies. The panelist discussed Germany's desire to double its contribution and concentrate on eliminating Russia's biological weapons (BW), but due to its own economic condition it was not able to do so.

The breakup of the Soviet Union has brought a new host of players into the world arena. The biggest of these, Russia, remains a difficult partner for the West due to internal economic and political strife. The panelist contends that it is difficult to foresee how Russia may be efficiently and successfully included as a Western security partner.

One of the issues receiving the most attention was the idea of expanding CTR to include social improvement programs for the local population. In the past, the economy and viability of entire towns were built around military industrial production. However, since the end of the cold war and collapse of the Soviet Union these towns are suffering due to the subsequent decline in weapons production. Although a sizeable percentage of workers formerly involved in production are currently involved in dismantlement activities, the completion of those activities will result in the elimination of their jobs. It has been proposed that a complete CTR program would establish social programs to protect and support the workers and their towns once dismantlement is complete. The panelist noted that executing a social program would be more beneficial than expanding the CTR to other countries. It would also prove that the United States is interested in the well being of other people and not just in its own national security objectives.

Another panelist agreed that social program support should be considered as a means to build relationships. Most FSU countries did not necessarily want to be involved in the cold war military build up, but were forced to sacrifice their own economies and are still suffering from the aftermath. It may also be in the security interest of the United States to protect the social interest of the participating country. The first panelist however, stated that these social welfare programs should be funded and implemented by agencies other than DoD, preferably by the international community.

A concern expressed during the discussion was that the United States may be placing itself in a position to be "blackmailed." The CTR program in effect encourages other countries to seek U.S. assistance for demilitarization and in so doing may indirectly promote rather than eliminate the threat. One panelist admitted that the United States must be very careful and clearly convey its priorities with regard to CTR. Firm ground rules and requirements need to be identified and established. Continuous self-analysis must be maintained to ensure that the United States has not compromised its position. Implementing the CTR program is a trial and error process; therefore education is fundamental to successfully achieving the goals of the CTR program. As the program progresses and matures, more expertise and experience will be gained. It was also pointed out that, since U.S. support is provided in the form of services rather than direct funding, any potential for "blackmail" is alleviated.

The panel was asked how the United States justified expanding the CTR program when recipient countries, specifically Russia, are not only failing to adhere and comply with their CTR requirements, but are continuing research and development of new weapons. Russia has failed to make financial contributions that have caused several projects to be delayed, most notably the chemical weapons disposal facility at Shchuch'ye and the fissile material storage facility at Mayak. This delay has nearly doubled the cost of the project and added close to five additional years to the date of completion, thereby making it virtually impossible for Russia to meet its CWC deadline. One panelist responded by stating that

anything worth starting is worth finishing despite increased cost. A project does not stop serving U.S. national security interests if its cost increases. These projects are significant and needs to be completed even if Russia is unable to contribute. While agreeing, another panelist added that Russian propaganda regarding new weapons may not accurately reflect the reality of the situation. One must consider Russia's poor economy and realize that the proposed military modernization would not be financially feasible. A panelist noted that Russia is not a perfect state and emphasis should be placed on establishing priorities and the foundations for a proper CTR system, rather than expecting a working system to already be in place. With respect to the CWC, it was noted that the United States is also having great difficulty in eliminating its stockpile and it remains a very difficult and costly task for both countries.

Additional candidates for the CTR program are North Korea and the Middle East. Before a program can be established in these countries and regions, they must both request U.S. assistance and agree to adhere to the CTR requirements.

Summary

The CTR program has been successful in helping to implement current arms control measures, such as the START Treaty. However, the program has been less successful in providing new opportunities for arms control, even though the potential to do so exists. The reality of the current CTR program is that it is based on a legislative initiative that has many requirements and specific procedures. The program is relatively new and ongoing efforts will provide useful lessons for the future.

The future of the CTR program and its expansion will depend on the contributions from the international community, while further U.S. assistance for CTR will depend greatly on legislative support in Congress.

LUNCHEON SPEECH BY
CONGRESSMAN DAVE MCCURDY
President, Electronic Industries Alliance

Thank you very much, Jay, for the introduction. It's a pleasure to be with you a little earlier than I expected. I will be on the panel this afternoon. When I got the call yesterday asking whether I'd be willing to stand in for Richard Butler, I agreed somewhat with trepidation because, as we all know, the ambassador is an icon in the arms control and counterproliferation community. Just his position, his stature, his experience and even his accent are enough to keep you on the edge of your seats. I certainly can't compete with that. As I'm an Oklahoman you may pick up a little bit of an accent but since I was just introduced by someone from Baja Oklahoma, it probably doesn't make much difference.

I guess I am here because of my experience and I bring you somewhat of a different experience and perspective. I love to tell a story about experience. One of my neighbors from just east of Oklahoma in the state of Arkansas, a Wall Street Journal reporter, was assigned the responsibility of going to Bentonville, Arkansas, to interview Sam Walton. Mr. Walton, the founder of Wal-Mart, was one of the richest men in the country at the time, a real unique individual. The article was to describe the nature of this incredible corporation that is now global. The reporter flies to Rogers and drives to the headquarters building, which wasn't very impressive – certainly not like Wall Street. He sees an old white pickup truck sitting out front, enters the building, and goes upstairs to meet with Mr. Walton. There he is in blue jeans and a denim shirt. Mr. Walton, in his seventies, was never known to be much of a talker. The reporter says, "It is really an honor to be here. I want to write a profile of your company. Just to get this started, can you tell me the nature of the success of Wal-Mart?" Mr. Walton looked at him and said, "Sure. It's easy. Good decisions." The reporter said, "Well, I really need something a little bit more than that. Can you tell me, what's the basis of all these good decisions?" Mr. Walton looked at him and said, "Experience." "Well, Mr. Walton, I have to write a lot of words here to fill this in. Can you tell me, what is the basis for all this wonderful experience?" "Bad decisions."

Those of us who have experience in arms control probably are here because we made both good decisions and, perhaps, some we would like to take back. The perspective I want to bring to you today comes from one who served during, I think, the most interesting time to ever serve in the Congress. The period from 1980 to 1995 saw the height of the cold war, the collapse of communism and the post communism era; the post cold war, and the gulf war. More importantly, we have seen the transition from the height of the industrial age, to the information age, and now to the digital age in America. That to me is as critical.

I have also spent a number of years as a business person, so I bring somewhat of an entrepreneurial background and slant to some of my views, and now, as the CEO [Chief Executive Officer] of the largest trade group that represents an industry close to completing what would, in an equivalent sense in basketball, be described as a dou-

ble-double – nearly ten million employees and 10 percent of the domestic product in this country. The digital age is truly global in nature. It has created one of the most dynamic, competitive industries in the world. I can assure you, working with these CEOs is different than working with those that you and I have come to know, like a Sam Walton, or even a Jack Welch or Norm Augustine or Phil Condit or some of those that we have seen in this industry. The folks that we now deal with, that are creating this new economy, often are young enough to be my son, who is a senior in college. They are millionaires who don't read the Wall Street Journal usually, other than to watch their initial public offering. They certainly don't read Foreign Affair. What they do read – Red Herring and Upside and Fast Company– is where they get a lot of their information about the business world, so we see there is a different sector being represented.

I also bring some perspective as a member of the commission to assess the organization of the federal government in combating the proliferation of weapons of mass destruction. Quickly, that's the commission chaired by John Deutch and created by Senator Specter in legislation two years ago.

Also, as a private citizen for the past five years, I have been able to play a major role in six different war games – three for the Army and three for the strategic assessment group at the Central Intelligence Agency, all looking ten to twenty years into the future. Now that's fun. I wish every one of you had the opportunity to participate in a war game scenario and I wish that all the senior executives in the federal government had an opportunity to do the same. It is an eye opener and it is a great opportunity.

Let me quickly lay my biases out on the table. My biases, where I come from – I am too old now to make excuses for what I think – I am an internationalist. I read an article the other day where someone used the term "globalist." I've seen polls where being a globalist is supposed to be a dirty word. Pat Buchanan has raised that to a new level. But I am an internationalist and proud of it. I'm pro defense. I'm pro market and pro tolerance, which is a rare breed in any one under 50 these days. I'm what you would consider a pragmatic centrist in either the Republican or Democratic tradition. Unfortunately, there are fewer and fewer of those in the Congress today. As a matter of fact, my friend, the Senate chaplain, was giving a tour of the Senate chamber the other day and showing where everyone was supposed to be seated. A visitor asked, "Chaplain, tell me, do you pray for the Democrats or the Republicans?" The chaplain looked at him and said, "If you look at this group, I pray for the country."

Weapons of mass destruction pose a grave threat to U.S. citizens, our military forces, and our allies. Clearly, vital U.S. interests in combating the proliferation of these weapons and their means of delivery is an important and paramount national security need for us. Those of us on the commission, and I'm not here speaking for the commission, in the year long testimony and fact finding we have undertaken, have come to a consensus that there are four areas that are of the greatest concern and threat. First, an area that you deal with every single day and is the nature of this conference, is the diversion of weapons of mass destruction, weapons, technology, materials, and people from Russia and the former Soviet Union. Secondly, terrorist use of nuclear, chemical, and biological weapons. Third, the threat posed by possession of nuclear, chemical, and biological weapons by Iran, Iraq, North Korea, and other rogue states. Fourth, destabilizing consequences of WMD [Weap-

ons of Mass Destruction] programs in the Middle East, South Asia, and East Asia. The magnitude and urgency of these challenges make it essential that the federal government be organized more effectively to combat the proliferation. That's the charter of the commission – to ensure that the federal government is organized to deter, impede, and interdict the spread of weapons of mass destruction and manage the consequences of proliferation, build the capability to defend, and be prepared to respond if, God forbid, they were ever used.

So there is a need to improve the overall U.S. government response – there are only 80 federal agencies that have some role in WMD – and to formulate a coherent policy, strategy, and architecture. Of course, any commission will say you need to have a more coherent policy, strategy, and architecture. In fact, I think we are of accord that is a major requirement. In addition, there needs to be closer coordination within our own government and cooperation with allies and friends abroad.

Quite frankly, we're far from having a comprehensive approach today. There has been great progress, however, and the government has undergone a substantial reorganization. John Holum will talk about the State Department activities and ACDA [Arms Control and Disarmament Agency]. This conference, sponsored by DTRA [Defense Threat Reduction Agency], is an example of what's happening within the Department of Defense.

I'm not speaking for the commission, but I will be one of the first to say that the head of this organization [DTRA] – and I'm not speaking specifically about Jay, or anyone else, I'm saying the position of the director – should not be a director. It needs to be at a much higher level within the Department of Defense. It needs to be both policy and operations and there are those who would recommend that this change occur. That's my personal view and I think others are in agreement.

John Deutch asked me to look at three principal areas: the organization of the Department of Defense, technology development, and policy and resource allocation – three requirements within the commission. He spared me having to look at the intelligence community; he took that on himself. I was asked to look at technologies that can advance nonproliferation and counterproliferation efforts. In my view, there is a critical need for an interagency process to develop coordinating, consistent, government-wide strategies to address these threats – country specific long-term plans to reduce demand. Strategies for technological denial and management of proliferation have already occurred. Then, obviously, we need to delineate responsibility within the Executive Branch and agencies to develop these programs, prepare for the threat, marshal the resources, engage our allies, and to look at issues such as budgets and sub-functions of budgets which is something we are focusing on. Then, lastly, I couldn't help but suggest that Congress itself ought to look at how it is organized. There are eight different committees with jurisdiction in the House and there are seven in the Senate. We were told specifically we couldn't do that, but I'm telling my former colleagues that a lot of the problems of following these budget functions and authorizations is the result of the truncated, ancient, anachronistic organization of the committees in the Congress. Other than that, they're okay.

In the area of technology acquisition just let me say – and I know Jacques [Gansler] was here earlier this week – there clearly has to be a technology acquisition plan coordinated with the Office of Man-

agement and Budget in the White House. I believe we need to develop an effective management taxonomy and integrated budget line to look at where the resources and technologies, are actually being developed – who's where, who's on first, what's out there. We are pushing them very aggressively to do that. Also, we need to look at issues such as combating proliferation and counsel the subgroups to focus on acquisition issues such as CPRC [Counterproliferation Program Review Committee] and NPACTWG [Nonproliferation and Arms Control Technology Working Group] and what their relationships are to each. Those are issues we will be addressing as well.

The last area is an area where my public and personal interests collide, and that is the area of exports and export controls. Clearly, export controls are critical to U.S. efforts to counter or combat proliferation, but establishing and operating an effective system of export controls is difficult under the best of circumstances because it requires the integration of national, economic, and security interests. It requires a consensus and there is no consensus today. It has broken down. We have been working under an export administration act that has expired and there is very little likelihood that it will be reauthorized for some time. I think that is regrettable.

There is also serious competition for industries that are engaged in global business. Nearly 50 percent of their profits today are generated outside the boundaries of the United States. Exports are critical to their success, continued research and development, and investments, which they are making at a greater rate than what the government is doing. Also, we're in the era of rapid technological advances, and that makes it difficult. Plus you throw in the issues of dual use technology and it becomes a very sticky problem. But perhaps that is where we start to address some of the philosophical issues. I think what we should be focused on the most as we enter this new era is the digital age. Even the ever cautious Allen Greenspan said the other day that the digital impact is changing the way we do business and has to be considered differently than it has been in the past.

While preparing to write a piece for the Council on Foreign Relations on leadership in the 21st Century, I came across a Rand Report entitled "Tribes, Institutions, Markets and Networks: The Basis for Organizing Society, The Building Blocks of Societal Organization." Clans, the family, have been the basic unit of networking from the beginning. We still see some countries that actually operate on the clan basis, however, they don't operate very efficiently. To build beyond the clan, institutions were developed – hierarchical institutions such as the church, the army, the monarchies, and the Soviet system. Then, because these institutions had limitations, we see the development of markets – the ability to communicate in disparate ways over a rapid spread basis. That too was successful and helped build, but it also has limitations. The next basis for organizing is the network, and we see that today. I think it is going to have a revolutionary impact on how we work, think, live, play, and do our business of protecting the security of the citizens of this country.

Government functions, including export controls, anti-espionage activities, and national security activities, are amenable to centralized control. Cutting edge science, entrepreneurialism, network, society, and business in the digital age are not. So what we see is the opposite effect. Rather than centralizing we see dispersal, what they call in business disintermediation – and it is

having a major impact. That's why I think it is very difficult to try to control, limit, and impede. It comes down to my philosophical position, which is "What are the realistic steps the U.S. can take in each of these areas?" It's very simple. It's technology. No nation keeps a technological lead forever, especially if you sit on it.

Up at Oklahoma University we used to play football. We didn't play much defense, but we played a lot of offense and won a lot of national championships. I guess it was ingrained in me early – the best defense is a good offense. I believe that we have to continue to invest as rapidly and as aggressively as we can in new technologies. We have to increase our research and development. We have to run further, faster, and smarter because this is a race that, quite frankly, never ends.

I noticed in the meeting that very little has been said about the Cox Report and China. I saw one author the other day though who, recognizing the seriousness of the allegations, said xenophobes on both sides, United States and China, are in the drivers seat on this relationship and they are playing a very dangerous game of chicken. I'm not sure I agree totally but I think it appears to be a one-sided argument these days. Quite frankly, we don't have to be buddies. Whoever coined the term 'strategic partners' with China was not being very realistic and certainly doesn't understand the nature of that society right now. But the reality is they are a growing economic power. Just their population base and geographical position make them a player in the future and I think it is in our interest to help direct them to make some choices that we would think most appropriate. That's why our organization, and others, still support China's accession to the World Trade Organization on commercially viable terms and believe that those who understand the need to put them in some kind of structure and regime economically would still agree with that.

Lastly, let me say that I'm not being purely Machiavellian, but I do love the story of Machiavelli. I don't know if you heard the one about when Machiavelli was dying. He was on his deathbed and a priest was called in to issue the last rites. The priest walks up to Machiavelli and takes his hand and says, "Do you wish to make a confession?" He said, "Yes." The priest said, "Do you ask forgiveness of your sins?" He said, "Yes." The priest said, "Machiavelli, do you renounce the devil?" He looked up and said, "Father, I don't think this is the time to make new enemies."

We can't always pick our enemies, and we do have a few, but as long as we stand for doing the right thing, then I think we will prevail.

Thank you very much.

PLENARY 3
ROUNDTABLE DISCUSSION:
NEW DIRECTIONS IN CONTROLLING ARMS

Chair
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Under Secretary of State for Arms Control and Nonproliferation, Designate

Ambassador Linton Brooks
Vice-President & Director of Policy and Strategy Forces Division
Center for Naval Analyses

Mr. Jan Lodal
Former Deputy Under Secretary of Defense for Policy

Congressman Dave McCurdy
President
Electronic Industries Alliance

Dr. Brad Roberts
Institute of Defense Analysis

Introduction

During the first half of the 1990s, arms control and nonproliferation activities were making rapid progress. The period from 1991 to 1997 was one of significant activity and success. The Strategic Arms Reduction Treaty (START) and the Comprehensive Test Ban Treaty (CTBT) were negotiated and START entered into force (EIF), the Chemical Weapons Convention (CWC) was negotiated and ratified, the Nuclear Nonproliferation Treaty (NPT) received indefinite extension, the Missile Technology Control Regime (MTCR) and the International Atomic Energy Agency (IAEA) were strengthened. Russia and China were active partners in nonproliferation and the United Nations Special Commission (UNSCOM) was executing its mission in Iraq. The strengthening of international norms and a growing appearance of a general international consensus on nonproliferation boded well for the future.

However, a transition occurred during the later half of the decade that threatens to slow or in some cases rollback those achievements. The Biological Weapons Convention (BWC) Ad Hoc group is making little headway in negotiating an investigation and compliance protocol, the CTBT is stalled in the U.S. Senate, START II languishes in the Russian Duma, and as a result START III negotiations have not begun. The relationship with Russia is becoming increasingly hostile, and China may be reversing its direction on arms control and nonproliferation. Nuclear tests by India and Pakistan highlighted a failure to stop two concerted proliferants. North Korea's long-range missile tests and its stagnant economy raise the specter of a rogue state missile threat. Iraq's defiance and division within the United Nations Security Council (UNSC) have undercut the legitimacy of emerging international norms. Additionally, new vulnerabilities stemming from the revolution in military affairs, such as information warfare, further complicate the tasks

facing the arms control and force planning communities.

The concluding session of the conference explored the major arms control and threat reduction challenges facing the United States in the coming decade.

It is unclear what type of international system is evolving as we move into the 21st century. Unless leadership efforts are redoubled and focused on the imposing threats, the international community risks losing the aforementioned gains as it moves into an uncertain future.

Strategic Arms Control

The panelists agreed that, while strategic nuclear arms control initiatives have made little headway as of late, nuclear threat reduction should be regarded as a top priority in the coming decade. Policy makers must evaluate the types of strategic arms control and threat reduction initiatives sought in the future. In the face of the current gridlock in START II treaty ratification, one panelist advocated shifting towards informal reductions in numerical limits. The U.S. emphasis on the Duma's ratification of START II may have resulted in the United States overlooking new arms control opportunities.

Inactivity in formal strategic arms control, which a panelist termed a "cold war relic," must not impede reducing the numerical limits on strategic arms and other items on the nonproliferation agenda. Another panelist opined that the diplomatic focus on strategic arms control has slowed progress in achieving the overall aim of nuclear threat reduction. If the United States lowered the number of strategic arms outside of the START framework to a level sufficient to maintain the nuclear deterrent, and committed serious financial support to the Cooperative Threat Reduction (CTR) program, major gains could be achieved in lowering the nuclear threat. This action would demonstrate that the United States is serious about nuclear threat reduction, as mandated by Article VI of the NPT. This commitment would enable strong diplomatic measures aimed at strengthening multilateral regimes, and checking the threat posed by rogue states and terrorist organizations.

Greater attention to future strategic stability is necessary. As the number of U.S. and Russian strategic warheads fall, the strategic bilateral relationship becomes a trilateral one. China becomes an important variable yet little is known about its strategic intentions. It appears that China is moving towards the deployment of multiple independently targetable reentry vehicles (MIRV). One panelist believes that a deployment of vulnerable MIRVed weapons systems, coupled with China's inadequate early warning system and low alert status, could result in a classic crisis-stability problem. Despite this concern, no effort is being made to encourage China to increase transparency in its nuclear program, or to initiate a dialogue regarding future multilateral strategic nuclear arms reductions.

In South Asia, policymakers continue to focus on rolling back India's and Pakistan's nuclear programs instead of addressing regional strategic stability. An opportunity may exist for introducing confidence and security building measures to reinforce nuclear bilateral deterrence.

The Road to National Missile Defense

Another panelist directed the discussion to the future of National Missile Defense (NMD) and what he regarded as the overwhelming political drive behind its development. This reality would make the abandonment of the strategic arms control

process, in favor of informal reductions, an implausible policy option. The pace of technological developments and geopolitical realities has outgrown the provisions of the Anti-Ballistic Missile Treaty (ABM). A negotiated modification to the ABM Treaty is needed and START II is a key component of any agreement. Deploying an NMD will require either ABM abrogation or modification. Abrogation, while politically unlikely in the panelist's opinion, would guarantee a strategic buildup and MIRV deployment by China.

A negotiated ABM agreement will be necessary. The panelist surmised that since progress on this front is unlikely before U.S. Presidential and Russian Duma elections, the United States has two years to devote intellectual rigor to the changing nature of the offense/defense relationship. This review must establish a coherent technical rationale that embodies ABM modifications that permit NMD deployment in exchange for certain concessions, such as a relaxation on Russian MIRV deployments. The review must also articulate a position on China's role in the strategic balance. The panelist indicated that ABM Treaty modifications would be impossible without concessions to Russia on offensive force structure.

The proposed size of U.S. NMD is insufficient to alter the balance between the United States and Russia. However, an NMD capability aimed at addressing a North Korean-type threat would affect China's nuclear posture. A negotiated modification to the ABM Treaty would likely include a fixed period of non-withdrawal, which could ameliorate China's concerns over the state of its nuclear deterrence. If NMD is inevitable then U.S. policy should seek to slow China's strategic buildup.

Another panelist offered the opinion that, even if the United States limited its defensive capabilities solely to theater missile defense (TMD), China would still perceive that an NMD breakout capability existed. Greater insight into China's perceptions and its military buildup is required. However, the current political environment will complicate a dialogue on issues concerning the United States' and China's vulnerabilities and their strategic relationship. The threat reduction dynamic in Russia is focused on rolling back a threat, while in China the objective is slowing an inevitable military buildup.

A panelist opined that an NMD deployment decision would not occur until 2001 due to political realities and delays in developing hit-to-kill technology, which would delay NMD deployment beyond 2005. Deployment of NMD aside, the TMD demarcation agreement has yet to be ratified. TMD deployment could result in a juridical abrogation if the United States and Russia fail to ratify the agreement.

As to the question of whether NMD could be regarded as inevitable, one panelist argued that technology might limit its development and deployment. Further, if the ongoing diplomatic negotiations with North Korea yield positive results, then developing NMD to counter a North Korean missile threat may no longer be justified. However, this view was not widely shared by other panelists. Domestic politics and the growing ballistic missile threat drive the political impetus for NMD; North Korea is but one state of concern.

The panelists believed that further analysis is necessary to evaluate the capabilities and limitations of a sea-based NMD based on the Aegis Missile System. Little is known regarding the affect that an additional operational requirement would have on the

Aegis system's overall performance. However, there was a general consensus that Aegis is the most capable system under development and would be the first to become available in the near future.

A second panelist cautioned that the political drive towards NMD might have overshadowed realistic analysis of the true value of defensive systems. History teaches that there is no ultimate weapon and that offensive systems are designed to defeat their defensive counterparts. He opined that the introduction of the Star Wars concept in 1983 was a contributing factor in the Soviet Union's decision to augment its biological weapons program.

Countering the Non-State Chemical-Biological Weapons (CBW) Threat

One panelist argued that focusing on NMD defense obscures the need for greater attention to other types of homeland defense, such as countering the threat posed by biological weapons (BW) terrorism. The panelist surmised that the next realistic threat is not an attack by strategic intercontinental ballistic missiles (ICBM) but by terrorists using unconventional weapons. The arms control dialogue to date is a mature paradigm, but emerging threats represent the biggest challenge from an organizational and technological perspective. The terrorist decision making criteria may be shifting from one based on a political agenda and maintaining the moral high ground to one rooted in vengeance, where the sole goal is to inflict massive casualties.

While the primary function of arms control is not to limit terrorism, it can help in the fight against this threat. For example, the presence of a multilateral treaty regime against terrorism provides a legal international framework to track down terrorists and outlaw their activities. This synergy between multilateral arms control and multilateral counter-terrorism regimes enables internationally accepted norms to be used in the fight against terrorism. A second example of this synergy is the domestic criminalization of activities that the state itself has foresworn. Third, most terrorists' self-concept is that they are more moral than their intended target. The operation of an accepted international norm can, in some circumstances, have an inhibiting effect on terrorist activity.

One panelist argued that terrorists are more willing to use unconventional weapons. Another argued that U.S. leadership in supporting and strengthening international norms is critical to an effective nonproliferation policy. Strengthening international norms is one of many tools in countering the terrorist threat. Other tools include a credible defense and deterrent capability, and an increased focus by the intelligence community on terrorist's capabilities and intent.

Multilateral Arms Control: Effective Implementation and Verification

Chemical and biological arms control is often regarded as part of a broad nonproliferation and counterproliferation approach. However, there have been recent difficulties in developing and implementing a unified chemical and biological arms control approach. The international organization tasked with implementing the CWC is still gaining experience and states parties, including the United States, are not yet in full compliance with the Treaty. Serious problems exist in achieving consensus in the BWC negotiations. Member states of the Non-Aligned Movement (NAM) have demanded greater cooperation in exchanging technologies, and the elimination of export controls and supplier groups. Additionally,

the legitimacy and establishment of norms for both the CWC and BWC have been undercut by the fact that, after more than two years of implementation, there has not been a request for a CWC challenge inspection and Russia, a signatory and depository of the BWC, has not been confronted about its BW program.

The U.S. arms control agenda lacks a cohesive strategy. Too often U.S. arms control policy seeks a new agenda, but does not focus on ensuring that existing multilateral regimes like the NPT, CWC, and BWC are effectively implemented, enforced and strengthened. Enforcing existing arms control regimes is essential to establishing credible norms and assuring viable future arms control regimes.

A fundamental difference exists in a policymaker's expectations of success for multilateral and bilateral treaties. The high performance – the ability to establish a high degree of certainty in compliance – of a strategic bilateral nuclear agreement is essential, but the low or moderate performance of a multilateral chemical and biological agreement is still in the U.S. interest, provided that those successes are integrated into a larger defense strategy. While a BWC verification regime with robust provisions for compliance monitoring is a key component to BW nonproliferation, an even greater challenge is addressing Russia's and China's current BW programs.

The panelist offered that approaching BWC verification by simply importing the CWC verification regime would not adequately address the unique BW challenge. The most important actions the United States can take to strengthen the BWC are to address Russia's BW program and reinvigorate the UNSCOM process. Failing to address these proliferation threats will have significant implications and will deal a debilitating blow to the international norm against BW. If the perception exists that Iraq was able to escape the UNSCOM process relatively unscathed, then a verification protocol will likely have a minor impact on the proliferation threat.

A major threat to the future viability of the BWC exists within ongoing negotiations in Geneva. Russia is attempting to undermine negotiations by redefining the terms of Article I, which bans all types and quantities of biological material and equipment that are not justified for peaceful purposes. By establishing threshold quantities, and an exhaustive list of illicit materials and equipment, Russia could create significant loopholes that would allow the treaty to be circumvented. This initiative, if successful, would undermine the effective implementation of a verification regime. High level discussion is necessary to stop Russia's efforts to undermine current negotiations. One panelist argued that the majority of states involved in BWC negotiations are against this initiative, and that the United States has signaled its opposition to altering Article I.

UNSCOM: A Litmus Test for Multilateral Arms Control?

The future viability of multilateral arms control may depend on the ultimate outcome of the UNSCOM mission in Iraq. While the CWC does contain minor, internal, provisions aimed at denying the privileges of membership to non-compliant states, the basic means to enforce these agreements is ultimately the UNSC. Currently the UNSC is divided and apparently uninterested in moving towards the next phase of the sanctions regime. It is unclear whether the UNSC would move with the same resolve and alacrity that it demonstrated after the Gulf War if a similar sce-

nario arose today, in which broad-based multilateral sanctions were sought. The perception of an empty threat from the UNSC may diminish prospects for enforcing international norms upheld by multilateral arms control agreements. The UNSC stands at a crossroads where it will coalesce and recover credibility in Iraq, or the current system of enforcing international norms will erode, leaving the United States and its allies to carry the burden.

One of the key lessons learned from the UNSCOM experience may be that imposing state sanctions resulting in humanitarian costs may be ineffective in influencing behavior and counter-productive in maintaining international unity. The UNSCOM process involved a multilateral, highly motivated and technical regime that was enforced with military interdiction. The inability to sustain the UNSCOM regime is primarily due to the costs imposed on non-combatants – a point that has been lost to the arms control community. The Iraqi embargo and sanctions were intended to influence the Iraqi decision-making calculus, but only resulted in affecting the Iraqi populous. International support for UNSCOM waned as the disparity between intended objectives and actual results became apparent.

Biological Weapons: Preparing for the Coming Threat

There was general agreement among the panelists that a better understanding of the BW threat is necessary. While in the past force planners evaluated contingencies for warfighting during a nuclear conflict, it was considered unlikely that troops would actually operate on a nuclear battlefield. This is not the case with the CBW threat. It is quite possible that U.S. or allied troops will fight in a chemical and biological environment. Force planners have taken steps to ensure troop operability in a CBW environment. On the tactical level force protection includes mandatory vaccinations and new lightweight chemical suits that allow troops to operate effectively for a long duration in a weapons of mass destruction (WMD) environment.

However, the panelist contented that one must conceptualize how the use of CBW would change the strategic environment. For example, if planning assumptions are directed towards major regional conflicts and small-scale operations, a CBW attack changes the logistical dynamic by threatening pre-positioned stocks, staging areas, and ports of embarkation and supply. Additionally, the United States is far ahead of its allies in the development and large-scale deployment of CBW defensive systems. As recent combat and peacekeeping operations have been conducted at a coalition level, a greater coordinated response to the CBW threat must be undertaken, lest combat operations be jeopardized through the exploitation of nodes of vulnerability amongst coalition forces.

Both state and non-state sponsored BW threats are more serious than previously estimated. Alarmist discussions concerning terrorism do a disservice to the public policy community. While it is more difficult for terrorists to produce and disseminate BW, it is still a serious threat. The production and dissemination challenges associated with biological warfare are onerous ones, and one panelist contended that the skill sets necessary for the effective employment of BW would be difficult to amass for a non-state actor. Aum Shinrikyo launched five documented, unsuccessful BW attacks after having devoted significant resources to BW development. The panelist claimed that the challenges associated with BW dispersal would reduce the likelihood of its deploy-

ment via an airborne or ICBM attack. He did, however, acknowledge that during the 1950s the United States tested BW agents in the South Pacific with aerosolized sprayers attached to aircraft. The results demonstrated that the agent would be highly effective over thousands of kilometers downwind, and would be capable of devastating a port or city. Furthermore, the production, dissemination, or delivery problems frequently associated with BW do not apply to the offensive use of infectious diseases, such as smallpox or influenza.

While the U.S. nuclear arsenal made BW a less-favorable option, major regional powers are likely to regard BW as a valuable weapon for use against their own people and foreign troops. The United States must evaluate and defend against potential BW threats if it expects to be capable of responding to two major regional conflicts, in regions with states that have known BW capabilities, while addressing smaller-scale contingencies in which asymmetrical force could be used. Better protection measures will be the deciding factor in whether a BW attack results in minor casualties or an operational catastrophe.

Another panelist argued that while the majority of DoD resources and attention has been directed towards the BW threat on the battlefield, the public health and law enforcement communities have not dedicated the same level of effort. BW counterproliferation programs are frequently co-opted by counter-terrorism missions. A clearer understanding of BW counterproliferation and key areas of vulnerabilities from a military planning perspective are needed. The interrelation between nonproliferation, counterproliferation, and consequence management will prove critical to an effective homeland BW defense. However, because these functions are regarded as organizationally and intellectually separate, gaps could develop in the overall national planning thereby producing unacceptable vulnerabilities to the BW threat.

It was suggested that a future role for the Defense Threat Reduction Agency (DTRA) might be to serve as the nexus between these various threat reduction communities. By conceptualizing the BW threat as a spectrum of interlocking activities, the United States would be better prepared to meet such a danger. The key role for DTRA in the BW field may be the detailed examination of what constitutes threat reduction.

Confronting the Russian BW Program

In 1992 President Yeltsin admitted that Russia previously had a BW program. Later defector reports provided insights about its scope and raised the possibility that the program still continues. The Trilateral Commission involving the United States, Russia, and the United Kingdom was unable to positively determine if the program was ongoing. Another panelist argued that without a verification regime in place the United States lacks the tools necessary to address the problem.

As BWC depository states there is a legal basis for the United States and the United Kingdom to engage in a real discourse with Russia concerning its BW capabilities and intentions. However, in the absence of a credible BWC verification regime several factors constrain the United States from engaging in such a discourse. First, the risk of compromising intelligence sources prevents many direct accusations over what may be specific violations. It is also unclear what sanctions would be used to back diplomatic threats. Curtailing CTR funds or opposing International Monetary Fund loans would further destabilize Russia, which could increase the risk of BW proliferation.

In the absence of a capable verification regime and on-site inspections conducted under a multilateral arms control agreement, no state is currently compelled under threat of international disclosure to reveal details of its BW program. Currently, financial assistance is the most effective measure of dealing with Russia's BW program. CTR programs such as the International Science Technology Center are making strides in engaging former WMD scientists and aiding in their pursuit of legitimate endeavors. These programs reduce the threat of Russian BW scientists making their knowledge available to terrorists.

The China Question

One panelist commented that China is the key to a united UNSC capable of enforcing international norms and committing to nonproliferation regimes. A China vested with an increased, invulnerable nuclear deterrent, even in the face of a U.S. NMD aimed at rogue nations, may be the key to strategic engagement and recognizing the value of multilateral nonproliferation and export controls. China's role in the Security Council on compliance enforcement and sanctions is complicated by its internal political concerns. Enforcement actions, such as UNSCOM in Iraq and intervention in Kosovo, can be perceived as internal interference in a sovereign state which China views in the context of Taiwan and possibly Tibet.

Another panelist indicated that China is troubled by the U.S. actions and uncertain over the future of the bilateral relationship. China perceives a widening economic and political gap, and a military dynamic that in the coming decades will place it as a modernized middle power while the United States strengthens its hegemonic position. China views U.S. pressure regarding nonproliferation agreements from a political rather than a security perspective. While the UNSC's enforcement of arms control agreements may help China's security, it further reinforces the U.S. global position. Another panelist indicated that congressional rhetoric continues to complicate a strategic dialogue with China. The absence of internal political consensus on the appropriate policy towards China will further the concept of "enemy creation" and hamper the necessary groundwork for a stable strategic relationship.

Summary

The current arms control and nonproliferation agenda is both sizable and complex. The key task for policymakers and the defense community at large is to focus on the primary threats of the coming decade and establish innovative measures to effectively prevent or counter them. A U.S. commitment to continued nuclear threat reduction is an essential component to demonstrating leadership within the international nonproliferation community. If NMD deployment, aimed at countering a rogue missile threat, is to become a reality in the next decade, steps must be taken to maintain strategic stability among the United States, Russia, and China. Nothing could prove more counter-productive to the intent of homeland defense than initiating an offensive arms race stemming from a perceived strategic imbalance.

The international norms developed in past decades against chemical and biological weapons are still vulnerable, and a concerted international effort must be made to strengthen the multilateral regimes designed to enforce these prohibitions on illicit action. A unified UNSC capable of demonstrating resolve in the face of nonproliferation violations is fundamental for perpetuating credi-

ble norms. Implementation of these agreements must be deemed a high priority to all parties, and the United States' global role demands that it confront possible noncompliance violations with all tools available, including the use of unilateral force. Greater attention and intellectual focus must be directed at the chemical and biological terrorist threat. If WMD are indeed becoming a favorable and enticing weapon for non-state actors, then U.S. preparedness must encompass all available tools and resources, such as the nonproliferation, force protection, law enforcement, and public health communities.

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ABBREVIATIONS AND ACRONYMS

ABM	Anti-Ballistic Missile
ACDA	Arms Control and Disarmament Agency
AG	Australia Group
APL	Anti-Personnel Landmine
ASAT	Anti-Satellite
ASEAN	Association of South East Asian Nations
BL	Biosafety Level
BW	Biological Weapon
BWC	Biological Weapons Convention
CBW	Chemical and Biological Weapons
CCW	Convention on Certain Conventional Weapons
CEO	Chief Executive Officer
CFE	Conventional Armed Forces in Europe Treaty
CINC	Commander-in-Chief
CPRC	Counterproliferation Program Review Committee
CSBM	Confidence and Security Building Measures
CTBT	Comprehensive Test Ban Treaty
CTR	Cooperative Threat Reduction
CVR	Center for Verification Research
CW	Chemical Weapon
CWC	Chemical Weapons Convention
DoD	Department of Defense
DTRA	Defense Threat Reduction Agency
EIF	Enter(y)(ed) Into Force
FMCT	Fissile Material Cut-Off Treaty
FSU	Former Soviet Union
IAEA	International Atomic Energy Agency
IC	Intelligence Community
ICBM	Intercontinental Ballistic Missile
IMS	International Monitoring Systems
INF	Intermediate-Range Nuclear Forces Treaty
IO	Information Operations
ISTC	International Science & Technology Center
IW	Information Warfare
LDC	Lesser Developed Countries
MIRV	Multiple Independently Targetable Reentry Vehicle

MOD	Ministry of Defense
MT	Metric Ton
MTCR	Missile Technology Control Regime
NAM	Non-Aligned Movement
NAS	National Academy of Sciences
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological and Chemical
NGO	Non-Governmental Organization
NMD	National Missile Defense
NPACTWG	Nonproliferation and Arms Control Technology Working Group
NPT	Nuclear Nonproliferation Treaty
NSG	Nuclear Supplier Group
NTM	National Technical Means
OPCW	Organization for the Prohibition of Chemical Weapons
OSCE	Organization for Security and Cooperation in Europe
OSI	On-Site Inspection
RMA	Revolution in Military Affairs
SACEUR	Supreme Allied Commander, Europe
SAE	Strategic Arms Elimination
SAIC	Science Applications International Corporation
SALT	Strategic Arms Limitation Talks
SLBM	Submarine Launched Ballistic Missile
SSBN	Submarine, ballistic missile capable
SSN	Submarine, “fast attack” nuclear propulsion
START	Strategic Arms Reduction Treaty
TLE	Treaty Limited Equipment
TMD	Theater Missile Defense
UNSC	United Nations Security Council
UNSCOM	United Nations Special Commission
WMD	Weapons of Mass Destruction